COOP'S SATELLITE DIGEST

MARCH 1982

Birth of a legend

National Microtech, Inc. introduces Apollo T.M. X9 Satellite Antenna.

National Microtech, Inc. continues to sell more home satellite antenna systems than anyone in the world. Microtech's new Apollo™ is so far advanced over our competition-in features, performance, and cost- that we feel Apollo™ is destined to become a legend in the satellite industry. If you are interested in buying or selling Apollo™ systems, give us a call today. Remember, no one sells the Apollo™ but Microtech dealers and distributors. See the legend today.

DEALER PRICES

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10 Units	$1195
100 Units	$1095

Optional remote satellite finder $495 wholesale dealer price.

National Microtech, Inc.

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COOP'S SATELLITE DIGEST

TOP OF THE MONTH

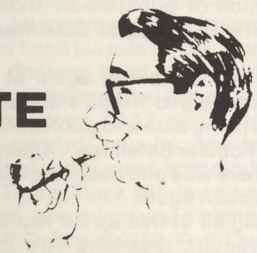
F3R. Heavy expectations. We all hoped, perhaps because of the long delay between the original F3 flight and the 'R' flight, that it would turn out to be a 'super' bird. We, also, all forgot that F1 has become an old, tired bird, and that few (if indeed any) of its 5.0 watt transponders are still plugging along at full steam.

We look closely at industry reports of F3R service in this issue. Mainly they say what we **thought** we saw back in the February issue. It **is better** than F1, for **most** of us, on **most** transponders. But it is no super bird. It won't change the way we do things; it won't bring in 8 foot dishes, or do away with 85 and 100 degree LNAs.

What it will do is open up **parts** of the Caribbean for 16 and 20 foot dishes, for five or six of the hotter transponders. Our cover reflects on what it has been like in the 'outback of the Caribbean' until F3R. This is a Bill Larsen (Monarch Corporation) 35 foot, 10.5 meter (!) spherical. Bill suggests it may be the largest spherical in the world today. Certainly it is the largest 'home built' antenna we've had reports on. Bill headquarters at P.O. Box 5308, Caguas, Puerto Rico (00626), where this kind of antenna has become an almost routine occurence at his shop. Congratulations on two **CSD** covers in 13 months, Bill!

MARCH 1982

COOP'S SATELLITE DIGEST



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COOP'S SATELLITE COMMENT

- New Selling Chance
- Contest
- Directory

CONCERT SATELLITE NETWORK

You may not of yet 'discovered' a Tuesday evening feed, at 10 PM eastern, usually on Westar (W1, TR 5 as often as not), called **"Concert Satellite Network";** CSN for short. This is a new enterprise first reported last summer in these pages. Here is how it works.

Private clubs (bars, if you will) install a TVRO. And, they install one or more large screen, projection sets. Each Tuesday evening they charge a special admission fee ($3 to $5 per head) to come in, sit down, and enjoy a live music concert from a group such as **Grand Funk Railroad.** Concerts last a couple of hours or less, and the idea is that, via satellite, private clubs can have 'live' performances of big name groups. The CSN folks hope to recover their transponder and uplink costs and make a few bucks; the clubs fill up (they hope) on an anotherwise 'slow' night, and, the artists play to a 'national stage' rather than a few thousand people in downtown Cleveland.

They tell me that there were around 50 clubs participating by the end of January, and another like number signed up and waiting for terminal gear. The clubs are 'licensed' to carry the broadcasts ("broadcast" may be a poorly chosen word, here) and those who are not licensed are not supposed to be watching. At least not outside of private homes, where what you do is your own business.

Part of the folks putting this one together is a group that distributes terminals. They have a natural interest in defending **their** sales 'turf', so there may not be much of an opportunity for other dealer/distributors to participate; at the outset. However, if CSN catches on, this could all change. There is certainly an opportunity for sales here if you have one or more rock-oriented night spots in your territory. You might check the Tuesday evening feed out, and then decide how best you can sell it in your area.

DEEP CUTS

Chalk it up to the unusually nasty early winter period, or, to the mysterious 'winter sale blahs' that hit the industry in 1981. This winter is proving to be a bummer, with some distributors reporting sales down by as much as 40%.

Measuring industry 'health', by checking on the movement of equipment, can be a dangerous undertaking. Dealers are ultimately responsible for the sales, but many simply pull down the shingle when the snow stacks up, and head for warmer climates. So measuring dealer sales may not be a good indication of what is happening to hardware movement. OEM's, on the other hand, may actually 'welcome' a winter breathing spell; treating it as an opportunity to refine product, fill distributor back orders, and get ahead of what they hope will be a big spring sales season, by stock piling completed hardware. That leaves distributors, who are usually working on borrowed or high risk capital, as the measuring tool. Distributors who service either the northern (2/3rds) area of the country, or all of the country, tell us they headed into late January running 35-40% below December sales figures. Those further south, shipping into Mexico, the Caribbean and elsewhere, tell us January sales were above December sales.

The 'Fedric Anamoly', apparently first identified by National Microtech's Dave Fedric in the winter of '81, seems very real none the less. And it takes no tutorial study to decipher that when the weather turns sour, you don't go dragging trailer mounted TVRO dishes about the country side to show off reception. The simple truth is that when the roads get impassable, people don't buy as much of anything. TVROs included.

We bring all of this up, up front, to temper those fears new sellers of equipment may be harboring after an exciting summer, and fall, selling period. Don't panic; watch for the return of the Robins, the spring baseball season, and, greatly renewed interest in home terminals. It's coming!

WAYNE AND ME

Reader Jim Beckett, in this issue, wonders what is 'up' between **73 Magazine** publisher Wayne Green, and Coop. The answer is nothing, but some explanation is required.

Two issues of **73 Magazine,** this past fall, dug into the explosion in the home TVRO field. Wayne and his staff have been anxious to develop the do-it-yourself interest of ham radio operators, in this technology, and we welcome that direction in 73. One of the two 73 issues spent several pages writing about Coop's contribution to getting this industry started. This was done as a means of illustrating to other hams (Coop has been a ham for 27 years) how a non-professional person can play a major role in getting a new technology off the ground.

Beckett, and others, have been wondering if Wayne and Coop were planning something further. Yes, and no. Wayne was down to the Turks and Caicos just one year ago, and time was spent together. Coop asked Wayne to give him some ideas on getting **CSD** published further east, since the Provo to Oklahoma City monthly air flights were wearing thin. Wayne suggested that perhaps **73 Magazine,** with a staff of several hundred and a professional organization second to none, might do the mechanical work of putting **CSD** out each month, under contract. That proposal came to a head at Omaha SPTS where Editor Tim Daniel laid a Wayne created proposal before Coop. For reasons that are no one's business outside of the 'in-discussion' trio, the proposal was rejected, and Tim went back to the drawing boards with Wayne. A second proposal, for the joint creation of a 'hands-on' monthly publication under the tenative title of **"Popular Satellites"** moved ahead, a square, however.

Daniel and Coop met again at the Anaheim SVS and the discussions ranged from **73 Magazine** handling 'some' of the **CSD** advertising sale and publishing duties, to a target date for creating **"Popular Satellites".** Again, no firm decisions on either project. **There was one decision;** Coop and Wayne needed to sit down in person again.

We bring all of this up for two reasons; one, to dispell well meaning rumors regarding 73's interest in satellite (TV) activities. Wayne feels, wisely we believe, that amateur radio needs to get back to experimentation; home workshop projects. Building hardware to receive TVRO signals is made to order, if

the data can be boiled down to typical amateur comprehension levels. We would like to help Wayne with this project, he knows that, and we are working towards a common goal. And number two? That **CSD** growth and change will be directed by anyone other than Coop. No way. End of subject.

STRICTLY PERSONAL

Many readers have followed the slow matriculation of the Coopers in this funny, little Caribbean nation since we came here in the summer of '80. For those readers, these words as an update. After 18 months of construction, it appears we will be moving into a real home after more than two years of living out of cardboard boxes and wooden crates. Susan and I will get a bedroom with an adjoining bath, Kevin will no longer have to sleep in a 'hallway' between the radio control room and the shop, and Tasha will move out of a corner of a TV studio and into her very own room. We certainly have not suffered permanent damage by living in a TV station, but each of us has private reasons for anticipating the move into the almost finished house, 75 feet east of the TV station.

True to Turks and Caicos form, right down to the wire, we have been fighting mis-placed shipments of polyurethene, bathroom fixtures that were shipped in error and a solar hot water system apparently designed by a monkey working at an experimental computer program at Harvard. Not to worry; we have adapted very well, thank you. Even operating WIV 24 hours per day has become second nature. This evening was typical; four minutes before his scheduled 7:25 PM commercial Ed Hegner (our air link to Florida) called with his new flight 'schedule'. He wanted it in his commercial. As I flipped on the studio mike to record his updated commercial, I had no audio. Three minutes to go. Unplug the mike cable at the mike and inspect the connections. No corrosion; it was cleaned ten days prior. 150 seconds to go. Pull out the opposite end from the audio board, and unscrew the plug cover. No broken wires. Two minutes to go. Trace the cable backwards to a junction splice. Untape the splice (everything gets taped here, to keep out salty moisture), and unscrew the two plug/jack covers. 90 seconds to go. Yup, a broken wire. Grab the Isotip battery operated soldering iron, and a piece of solder. Connection almost as good as new. 30 seconds to go. Fast forward the tape to the cut-in point. Open the mike button and drop in the seven second change in the audio copy. Rewind the tape to the 010 position on the counter, wheel around and glance at the air monitor. The network news is just going into their break. Hit the slide projection chain camera position on the switcher, and roll the audio tape. No seconds to go. And then while the 60 second commercial is running, leisurely retape tape the opened up junction splice.

A year ago, I would have at least developed a sweat in that three minutes. Experience mellows sweat, I find, and anxiety. When Susan and I head to Florida every month or two, 12 year old Kevin operates the full station. He breaks for commercials, watches the meters, rolls the tapes, runs the station breaks, and still finds time to go to school, scuba dive and carry on like most normal 12 year olds.

Which brings me to the real reason for this brief message. Ten year old Tasha, our daughter, needs a few pen pals. Tasha is studious, inventive, a lover of animals and mystery novels. She is counting the days until her 11 year old cousin from California comes to spend the summer. After some small family haggling, we recently acquired a second hand bicycle for her. She loves to pack a lunch, a cat, and her dog and head off down the coral covered trails to a 'secret spot'. She's normal (for a Cooper), but she needs some outside-of-Provo 10-12 year old girlish 'thoughts' to stimulate her mind. If you happen to have a daughter or grandaughter in this age bracket, who might enjoy a pen pal friendship with our Tasha stuck off down here in the 'backwoods of the Caribbean', you might pass along Tasha's address. It is Tasha Cooper, P.O. Box 100858, Fort Lauderdale, Fl. 33310. And I thank you.

CONTINUED · page 50

SELLING NEW MARKETS WITH FNN

FNN/Financial News Network. Available to a wide variety of terminal operations including small MATV systems and private (micro) systems.

SELL IT

One of the problems many dealers of TVRO hardware have is focusing on the strengths of their product. If you are a dealer, you may recall how difficult it sometimes is to bring the attention of the potential customer to that **one service** that may cinch the sale. After all, you have 40-50-60 plus video channels up there, and it is understandably difficult to draw the attention of the would-be buyer to the one service that will make it impossible for him to say no.

There are a number of unique services available. One happens to fit the unique tax position which certain (lucky) folks find themselves in; they have an income area which actually could, if properly directed, pay for the terminal as a full business expense. It is one thing to talk somebody into putting out upwards of $4,000 for a terminal, which they will 'play with' and enjoy; it is quite something else to talk them into spending the same amount of money for a terminal which they can treat, for tax purposes, just as they treat paper clips and typing paper. That's what this report is all about.

You may not be into a tax bracket where business expenses separate themselves from personal, "descretionary" purchases. The IRS allows folks who have a business or investment interest to deduct items which they purchase, as a **business** expense, **provided** those items contribute directly to their business activities. Nobody, including the IRS, would deny a surgeon the right to deduct as a business expense his annual supply of scalpels; for example. Nor will they deny a farmer the right to subtract a proportionate share (called depreciation) of a combine from his gross income. The same rules apply to people who invest for a living; those who put their money to work for them by purchasing stocks and bonds, or buying grain futures and municipal bonds.

This is not a qualified lesson in tax-economics. For that, you'll have to do your own local sleuthing. **It is** a lesson in selecting an appropriate service to approach a prospective client with, and to use that selected service as a 'cornerstone' for building an attractive 'portfolio of services' for a prospect; **your prospective client.**

Although the Financial News Network is a relatively new satellite service, FNN is not all that new as a service. FNN appears over on Westar III, transponder 7, from 10 AM to 5 PM, weekdays. Now those of us who have grown up on satellite fed **specialty** services have grown accustomed to something-less-than-(major) network sophistication with the video product. We have grown used to sloppy mixes, poorly timed switches, and video that does not match the audio. We are sophisticated enough to recognize that somebody with fewer bucks than ABC, CBS or NBC may not be able to create that clean, on-air-product which the major US networks have created. Surprise. FNN looks every bit as good as any of the three major US networks. It looks better than CNN (sorry Ted!), but that is a subjective call.

We mention their 'on-air-appearance' up front, because all too often when you begin to report on a satellite available service, you tend to make 'allowances' for what we all recognize is a smaller operating budget base, and somewhat less-skillful artisans. It is therefore very refreshing to see that a service playing to a limited, even small, audience is somehow able to maintain a crisp, high quality 'look'.

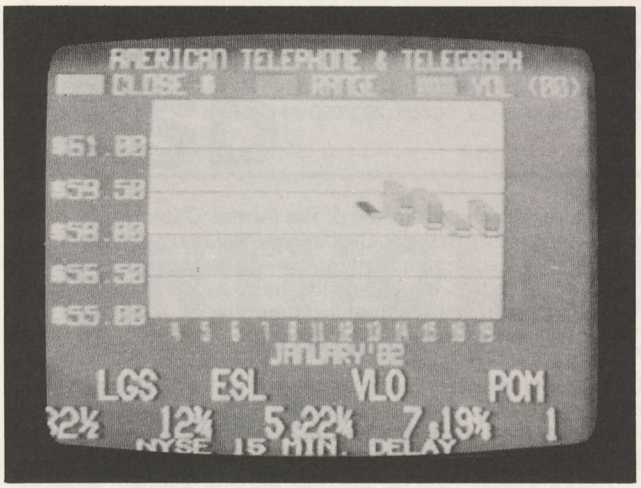
FNN is not fault free, certainly. But then, neither are the so-called major networks. FNN is an extremely comprehensive video plus audio service that goes far beyond the intense, specialty interest one finds bottled up in the wallet of hard core stock investors. Apparently, somebody at FNN believes the propaganda that tells us all that more than 26,000,000 Americans own stock, in something. The result is a smooth flowing, articulate, but easily understood (even by the layman) report on not only the day's pungent financial activities, but also the factors behind the world of high finance, which make **that world** rotate on its own peculiar axis.

FNN is a broadcast television service. It is available via more than a dozen television stations, nationwide. That **may** eliminate it as a possible selling tool in **your** area, if a local station is already plugged into the FNN network. Best to check that out, before you charge ahead!

FNN draws upon its own considerable Santa Monica (CA) studio resources, and equally on correspondents who either are stringers for the network (some familiar names one also sees from time to time on CNN, for example), or, who are employed by the news departments of network terrestrial station affiliates. FNN, like CNN, works back and forth; between hard stock market reports (i.e. that 'hard news' of **their** library), and, special videotaped reports that dig into corporate and market trend events that may today, tomorrow or next month have some bearing on the price of stocks. FNN is available to cable systems, and since Westar III is also used by CBS Cable and SPN, to mention a pair of well established cable services there, more than a few of the cable firms have discovered the attraction of the FNN service. FNN makes **no charge** to cable firms for their service; it is supported by advertising.

The advertising one sees on FNN is from a strange, perhaps not so little world, all to itself. There are people hawking $500 per year 'insider newsletters' and people selling miraculous electronic calculators designed to speed stock market quotation analysis. You won't see 'Special K Cereal' advertised on FNN.

FNN rotates anchor people who slide effortlessly in and out of the hard quotation information, and the features that make up the real continuity of the full 7 hour broadcast day. All of the anchor personnel are professionals who would do ABC or CNN proud. It is the



NOTHING SHODDY about the FNN 'look' on the air. Your customers will come away with an upbeat attitude, even if the market is 'down' that day.

kind of service that you may tune into out of complete curiousity, but which, six hours later, you still have turned on. The news floats fast enough, and the features are interesting enough, that it hovers someplace between a background service that stays out of the conscious mind, and, a foreground service that has you on the edge of your stool.

But alas, because of stock market rules, it is a 'late service' for the **hard core** investor. All market quotations are delayed by 15 minutes. Why? Well, the folks who run the financial world have a little 'private' agreement. It allows them to distribute real time (less the electronic circuit delay) data to themselves, but to others ... there is a built in 15 minute buffer. Yeh, that's a tad unfair for the rest of the world, but alas, that is the way they play the game. Not to worry. Very few investors whom you may approach about purchasing a private terminal, so that they can 'tune in' the FNN service, are going to be up tight about that 15 minute delay. If they are that type of investor, they already have several hundred dollars per month wrapped up in a 'hot ticker tape' service into their home or office. What **they** will get from FNN is a wide, fascinating, variety of background information (the so-called 'feature material') which will make them more knowledgeable, expert investors. And that is something they cannot obtain from their 'hot ticker' service.

FNN does play the 15 minute delayed ticker across the screen, full time, all day long. To our surprise, after a few minutes of watching, you don't even notice or focus on it. It is simply not there to the conscious mind. And for most of the 26,000,000 stock owning 'investors in America', a 15 minute delay in current trend or specific stock pricing is not a matter of life and death anyhow.

Now FNN is smart enough to know that financial investor type people do not ignore the balance of the world. In fact, they are smart enough to realize that the day's non-financial-community activities often have a greater bearing on the day's stock market performance than the stock market news itself. For this reason, they include regular, several-times-per-hour, headline news updates. You won't get much of the blood and gore news here; but if the news can in any way impinge upon the condition or activity of 'the market', you'll hear it here almost as fast as you do over on CNN.

There is one other aspect of the FNN service which may be very appealing to some of the national distributors of satellite hardware. Because of the nature of the FNN audience (one assumes monied people, with keen insight and an 'upbeat' life style), reaching that total audience 'universe' may not be a bad national advertising marketing approach. Where else could you take $2,000 and purchase a half minute of time for a commercial message that will reach coast to coast? You won't run a **single** ad, of course, and the cost of preparing the 30 second commercial will be several times the cost of the commercial time itself. But for a relatively modest $20,000 adver-

tising budget, a national distributor of TVRO hardware could put together an effective 30 second spot and buy 7 or 8 appearances on FNN. If the distributors working with the national firm, or the dealers, were to "co-op" (i.e. help pay for) the commercial packages, a rather sizeable advertising budget could be pooled and put to work.

If you want to learn more about FNN, **CSD** suggests you tune in any weekday from 10 AM to 5 PM eastern. If what you see is attractive to you, and you think there is a 'marriage' there between what you do locally and what they do nationally, we suggest you contact Rod Buchser at the Financial News Network, 2525 Ocean Park Blvd., Santa Monica, Ca. 90405 (203/450-2412).

F3R REPORT HOW WELL, WHERE?

BUT - Is It Better?

The saga of RCA's third bird has been told and re-told. And we promise not to do it again. We will note, however, that the 3R bird is a transition design for RCA, taking some from the old(er) F1 and F2 proven designs, and some from the new F5 and F6 birds. What we hoped to see in F3R was some advance warning of just how effective the yet-to-come Satcom birds may operate. We'll give you the bottom line up front. We have not seen enough from F3R to give us the confidence we hoped for. On the other side of the coin, nor have we seen enough to shake that 'hope' that the F5 and after bird series will really be better. In short, F3R as a preliminary peak at the next generation of Satcom birds, has been something of a failure.

Does that say that F3R is not operating properly? **No,** not at all. F3R would appear to be operating 'normally', although based upon **CSD** reader reports, we cannot agree with the RCA 'hype' released shortly after the end-of-December switchover, which generally characterized the bird as a technology advance. Nor can we subscribe to statements from cable programmers, such as HBO, who were generally enthusiastic about the "improved F3R service"; vis-a-vis F1.

There are three major areas of Satcom design, which interplay with the service contours (i.e. signal levels), we anticipate seeing and using with 'small', TVRO, terminals. They are:

1)The ability of Satcom designers to achieve 'optimum illumination' of the earth below, with the Satcom transmitting antenna system.

2)The impact of higher power (i.e. 8.5 watt versus 5.0 watt) transponders.

3)The 'stability' of the bird at its assigned orbital position, to maintain **not** the orbit position, but the orbit 'attitude' (i.e. insuring that the bird's polarization integrity is kept on the money for both long and short term periods).

We'll look at all three, plus other factors effecting the performance of the bird, here in this report. This month's report on F3R performance has been created from dozens (and dozens) of reader observations. With the exception of Hawaii, and Alaska, we had reader reporting forms from every nook and cranny of the USA (and much of Canada) to work with. We had asked readers to complete **CSD** provided reporting forms and the reporting forms were designed to extract a maximum amount of data, painlessly. Basically, they solicited detail from each observer portraying how the operation of the (new) F3R bird compares with the operation of the former 'CableNet One', F1, bird. Recognizing that not all observers are equipped with refined signal measuring equipment, we suggested three levels of reporting. Readers could provide hard carrier to noise ratio (CNR) reports, relative signal level reports, or, basic 'B', 'S', or 'W' (better, same, worse) observations.

With a wide geographic spread of observers, and the near proximity of observers in most regions of North America, **CSD** readers represent a hard 'data core' which even RCA cannot match. RCA will probably learn a few things about the **actual** operational characteristics of F3R from what follows.

Here are the criteria we used in analyzing reports. First of all, no single report carried any measureable weight. That is, when comparing and adding numbers we automatically 'toss out' the highest and the lowest numbers. This helps insure that inaccurate reports do not unfairly 'weight' the overall averages. Next we looked carefully for reports that ran contrary to others in the same geographic 'region'. The Great Lakes, for example, was an arbitrary 'region'. This helped insure that someone who did a poor job in aligning on the new bird does not get into the average-pool. If you look at the results to follow and discover "My report does not agree with the averages shown", you can probably be sure that your report was 'tossed' as not fitting the mold. Is that safe, or accurate? Yes, because we now know enough about satellite service to know that it is **uniform,** at least across relatively short spans of ground (say a few hundred miles in any direction, from a given location). This says that if someone in Columbus has noisy pictures, and someone in Cincinnati and Louisville have good pictures, the problem is with the Columbus terminal installation, **not** the satellite **'footprint'.**

Next we looked for patterns that were peculiar to the new bird. Transponder 22, for example, is uniformly 'poor looking' from coast to coast and border to border. Yet many people who had the ability to measure at least relative signal levels found the 22 carrier representative of others in the same six-antenna-set (i.e. 2, 6, 10, 14, 18 and 22). How can the carrier level be up, but the carrier to noise be down? We'll see.

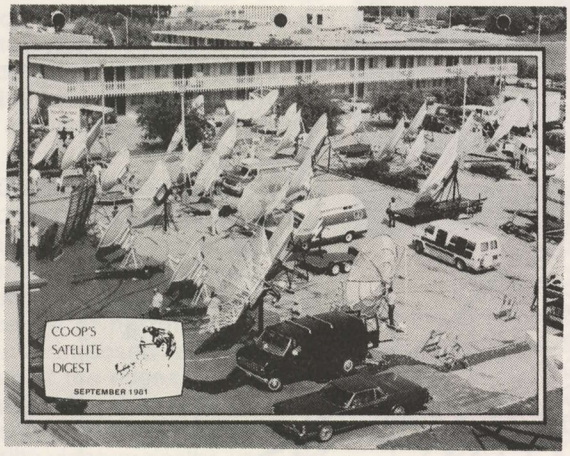
A number of **CSD** prepared maps are included with this report. Of prime interest to users of the new F3R bird are the direct comparison charts (four total) which indicate how F3R service stacks up to the former F1 service. We have taken the four now-well-known Satcom antenna sets and provided a map for each. All of the transponders on vertical antenna set 'one' (that is, transponders 1, 5, 9, 13, 17 and 21), for example, were studied on all reports submitted. Individual transponders, within that antenna set, were 'averaged'. If a reporter provided relative signal level readings, we added up the individual transponder readings for the full set of six transponders on each bird, and determined the average reading for the full antenna set. Then we simply compared the 'average' F1 reading with the 'average' F3R reading. If the F3R 'average' was lower than the average F1 reading, this location was moved into the 'worse than' column. If it was the same (within a window-range of numbers), it moved to the 'same-as' column. And if better, then to the 'better than' column. These then were spotted on our North American map, and from the individual spottings came the patterns which we have created here.

Why not treat each transponder on a transponder by transponder basis? Several reasons. First of all, if you understand the mechanics of RCA Satcom family satellites, you already know that by grouping the 24 transponders into four sets of six each, and then dedicating a separate 'transmit' antenna (feed) on the bird to each set of six, you have four possible earth-contour 'EIRP patterns'. This says that you have

CSD ANTHOLOGY

MORE than 1000 pages (!) ; the FULL history of Home Satellite Terminals from. . .

Volume One, Number One
(October 1979)
through
Volume Two, Number Twelve
(September 1981)



The UPS....the downs. **The trials**....the tribulations. **The successes**....the mistakes. It's all here. As it originally appeared in print, from the first issue of **Coop's Satellite Digest** in October of 1979 through and including September 1981. A super-big, history and reference set all rolled into one huge 1000 page-plus Anthology! Not one word is changed. Only a 16 page "Coop Forward" has been added to the original text. The rest is the month by month growth and development of an infant industry, from perhaps 20 terminals per month to more than 2,000 per month; in two short years! A collectors issue you will never part with, done in a bound set of two separate annual volumes (issues 1 to 12, and issues 13 to 24). **Trace the development** of products, concepts, and companies; month by month, issue by issue. **Trace the development** of every product now in the industry, from its first appearance in the industry. The Oliver Swans, the Taylor Howards, the Clyde Washburns, the Robert Colemans. They are all here, month after month, issue after issue. **Here's how to order:** Use order form appearing in this issue of **CSD**. Release date is April 01, 1982. Order either the complete 24 issue Anthology for $100 (imagine - no change in price from the two year CSD subscription rate; no adjustment for inflation!), or, either single set for $60. **BUT order today**; only 1,000 complete sets are being printed and when they are gone....that's all she wrote!

similar patterns for each of the four antenna sets. But what if you have variations within the antenna set? What does that tell you?

If the anamoly is with one, or just a few installations, you suspect a terminal problem. If the variation is widespread over a large geographic area, you suspect the transmit antenna coupling configuration. If the variation is continent wide, you suspect the transponder itself, or, the uplink transmitter (operating below saturation). We have some of each category showing up in the reports, and we'll identify them.

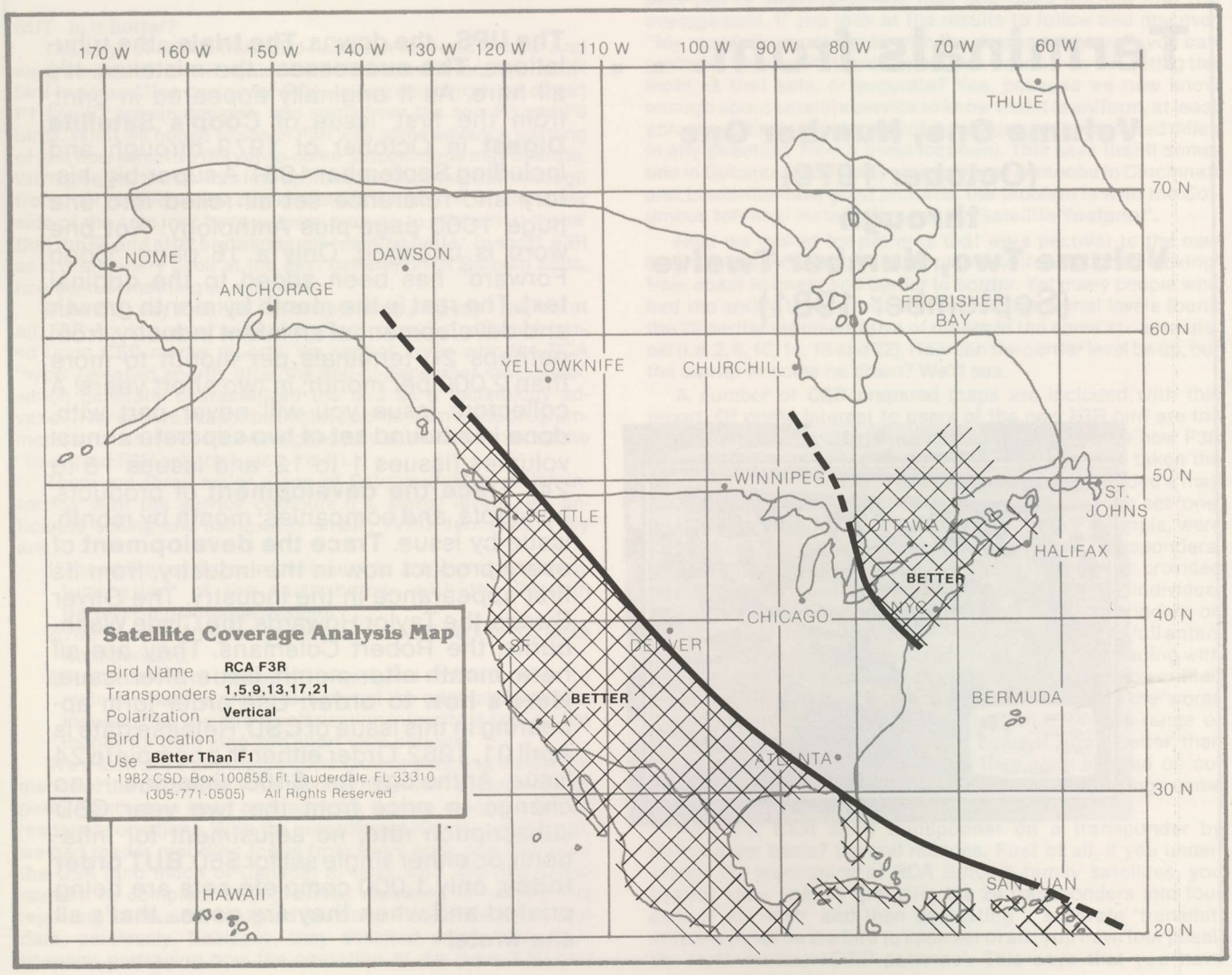
WHAT RCA hoped to do

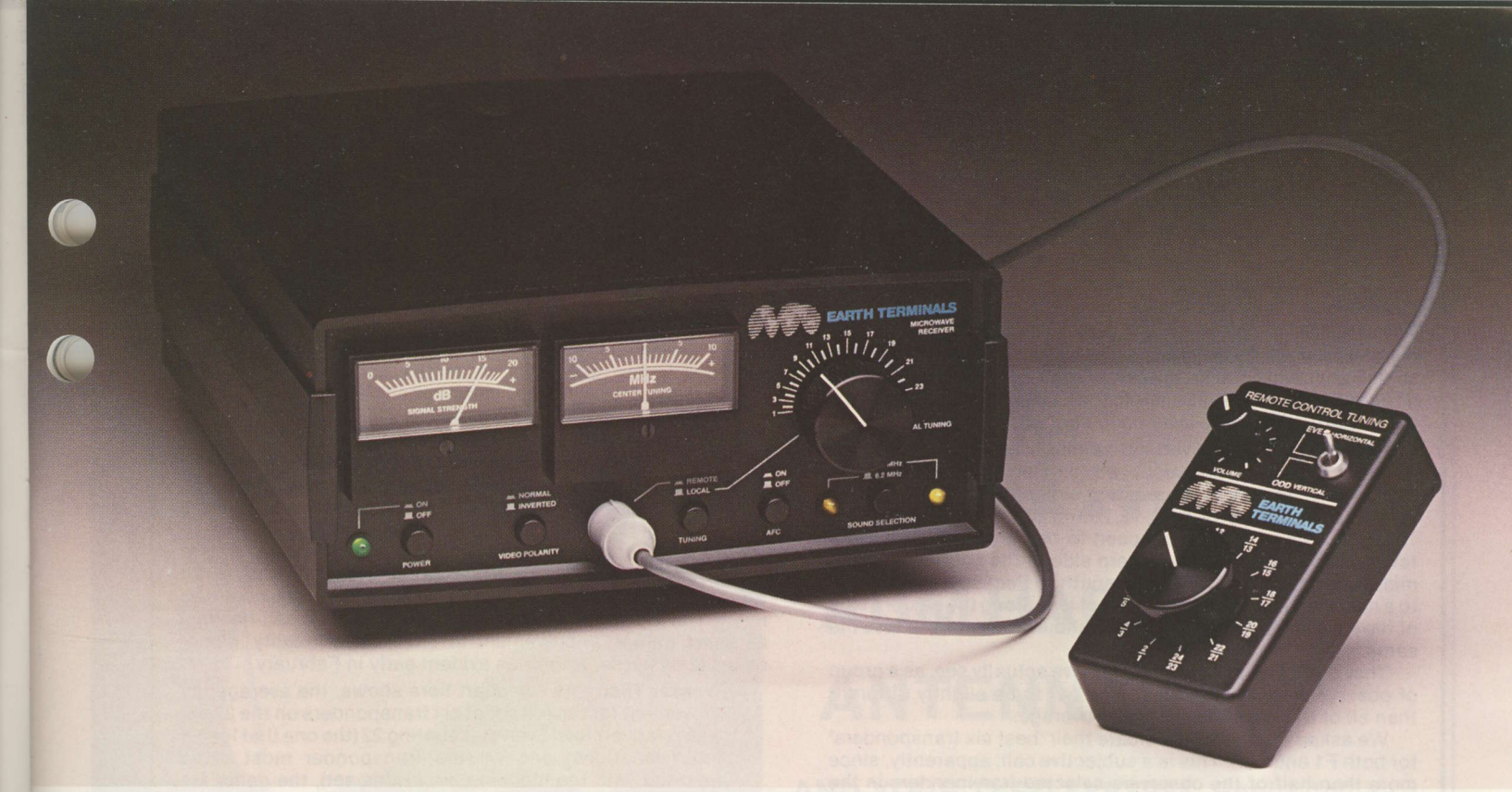
RCA had hoped that the F3R bird would give them an improved signal service in two areas of the country; the 'southeast', and, 'New England'. The F1 problem with the southeast was caused by a combination of boresight adjustment, and, look angle 'fringing'. The F1 bird has a boresight center in the Iowa region. Boresight can be adjusted, from the ground, at anytime. But, if you were to readjust the boresight towards the southeast (for F1), you would then lose some signal in the northwest. You cannot 'expand' the coverage area from the ground, after the bird is launched; only move it around. If you want to expand the coverage area, you do that back on the 'drawing boards', when you are creating the transmit antenna system for the bird. One way to bring the signal in the southeast up, by say 1 dB, is to 'spread' the pattern wider around the edges. You do this by reducing the strength in the center. Think of it as a gallon of water. You can fill up a container 24" in circumference to a depth of 4 inches, or a container 36" in circumference to a depth of 2 inches. The gallon of water does not change; only the size of the container. The transmitter power on the bird does not change, only the size of the area that a given level of signal will reach.

RCA has not been disappointed with the antenna configuration found on F1 and F2, so no **major** overhaul of the antenna configuration was planned for F3R. That's good for small terminals, since while we could use slightly beefier signals, we don't want to chance losing signal in areas now served, because some brand new antenna pattern that **looked great** on paper proves unworkable in practice. F3R uses the same basic antenna transmit pattern configurations as F1 and F2; skewed, or adjusted, slightly to the southeast, from Iowa's F1 boresight.

WHY are there variations?

What RCA did promise with F3R were four of the brand new 8.5 watt generation transponders. In the future (F5 onward) all 24 transponders will operate at the 8.5 watt (maximum power output) level. For the record, the difference on the ground, between your watching a 5.0 watt transponder, or, a 8.5 watt transponder, is just over 2.0 dB. And 2.0 dB is the difference one anticipates seeing when one switches between a 10 foot dish and a 14 foot dish. Clearly, if your pictures (in Kansas, for example) were 'perfect' on a ten footer with F1, a switch upward to 8.5 watts would also allow you to **degrade** the antenna size to approximately an 8 footer. For now, while only a few of the transponders have the higher power, an 8 footer in the center of





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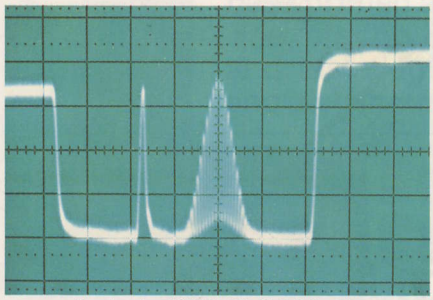

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the boresight pattern will not be satisfactory for most viewers. Years from now, an 8 footer **may** prove to be effective, with **some** of the birds, in **some** of the locations.

So we can anticipate some transponders looking stronger than others, simply because they are higher power. And, depending upon where you are located, we can also anticipate some transponders looking stronger than others because of the differences in coverage built into the four antenna patterns. For the record, horizontal transponders 2, 6, 10, 14, 18 and 22 (horizontal set one) and vertical transponders 1, 5, 9, 13, 17 and 21 (vertical set one) are supposed to be boresight adjusted to look more favorably at the **western** side of the continent. Conversely, transponders 4, 8, 12, 16, 20 and 24, and, transponders 3, 7, 11, 15, 19 and 23 are supposed to be boresighted for more favorable coverage to the eastern side of the continent. In the middle, from roughly Cleveland south to Pensacola, westward to a north/south line running more or less along the eastern side of the Rockies, all 24 transponders should look more or less the same.

That's what we should see. What we actually see, as a group of observers continent wide, turns out to be slightly different than all of this carefully planned coverage.

We asked reporters to indicate their 'best six transponders' for both F1 and F3R. This is a subjective call, apparently, since more than half of the observers selected transponders in the 'best 6' category which their hard-number signal level meter readings indicated were not necessarily 'the strongest'. Or, it points up the individual idiosyncracies found with both individual terminals **and** signal level read-out systems. After transfering these numbers to tables, we then went back and looked at the individual reporter signal level readings. With so many different meter scales and read out systems around, what these 'hard numbers' told us was relative changes only. However, even relative changes (as opposed to absolute numbers equated to dBs of improvement or reduction) are important, **if** they follow a 'pattern'. They did, with surprising accuracy, when you stuck them onto work-sheet maps.

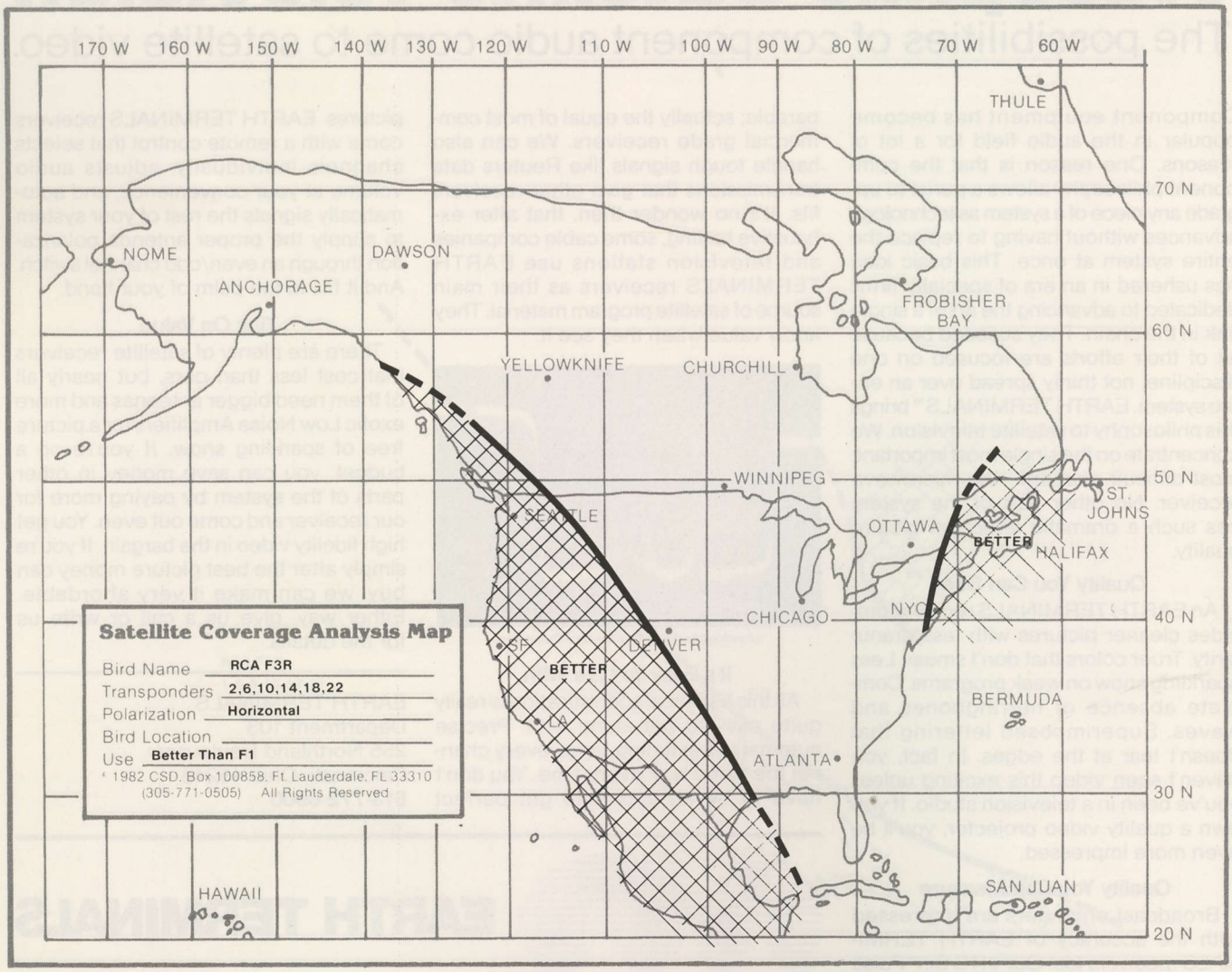
Let's deal with the two ends of the observations first.

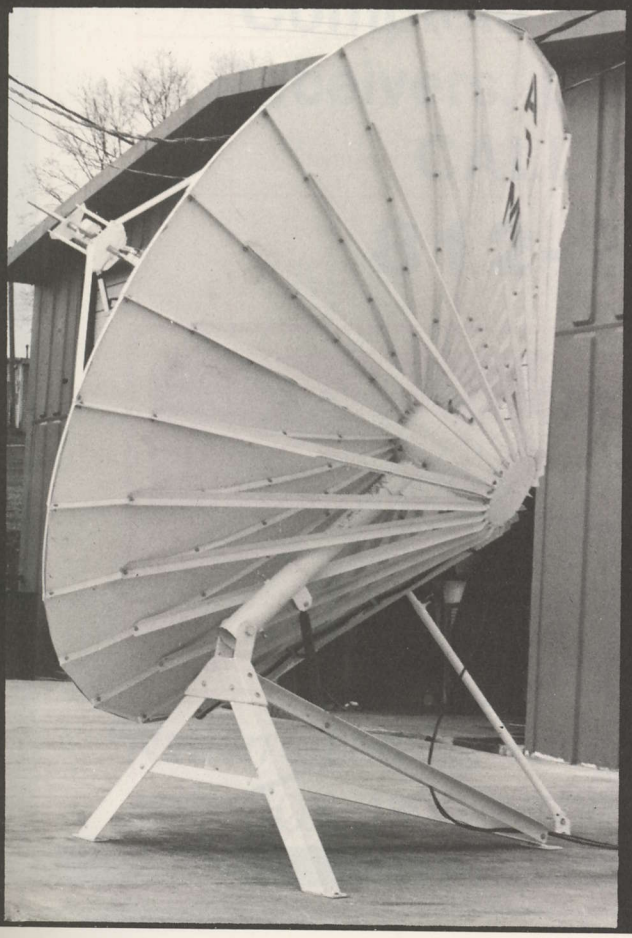
1)**Weaker Than** - Transponder 22, virtually continent-wide, lost ground. The pattern is so universal that one wonders if the transponder is operating properly.

Several observers report that while the carrier reading is reasonably good (equal to at least **some** of the other transponders in the 2, 6, 10, 14, 18, 22 'set'), the video quality is noisy. The problem may have been correctable (or self-healing) as **some** (minor) improvement in TR22 video 'quality' (if not necessarily carrier level) was evident early in February.

2)**Weaker Than** - As the chart here shows, the average improvement for the full set of six transponders on the 22 set was relatively low. Even discounting 22 (the one that lost in most locations) and 14 (the transponder most often reported with the highest gain in this set), the gains are small, typically none at all to + .5 dB.

3)**Stronger Than** - The most universally improved





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transponder was 7, already the 'top measured signal level' at many locations from coast to coast. This was followed by 11 and 3 with 20, 23 and 24 also mentioned often enough to indicate a 'pattern'.

Our interest here is in spotting the **really** powerful transponders; RCA suggestions aside. We know, from past F1 experience, that because of bird waveguide coupling configurations, and other factors not readily identified by RCA, that there are going to be certain transponders which **'exhibit'** high power characteristics **regardless of** the actual indicated transponder output power.

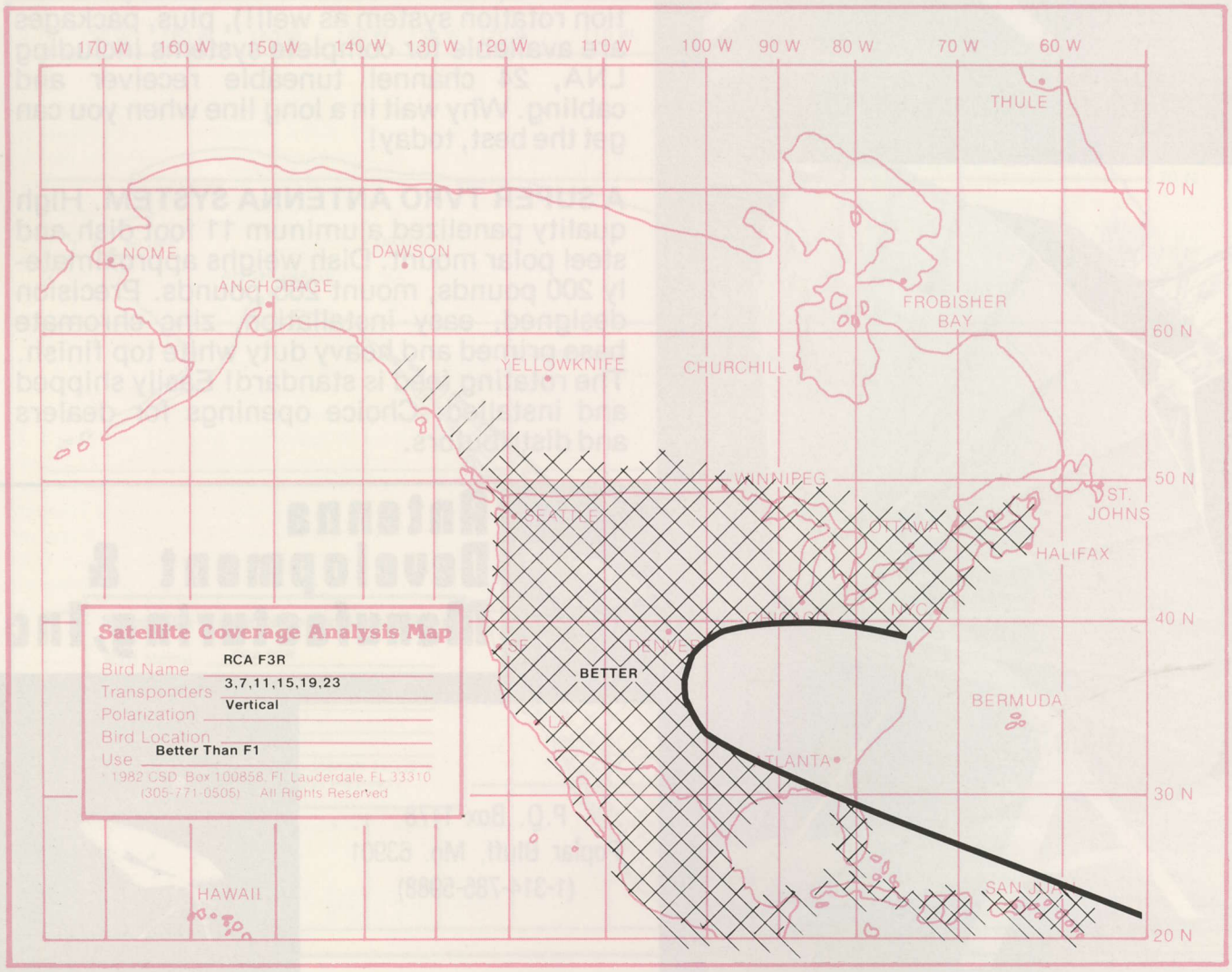
Into this analysis you must plug your own location (or the location of the projected terminal), since we have four different boresights at work. Why? Well, the difference betweeen being **on boresight** for transponder 6, for example, in the western USA, or, being in Florida, can be more than the 2.1 dB theoretical difference one would expect to find between a 5 watt and a 8.5 watt transponder. This says that **on boresight,** they all look strong, but off boresight the 8.5 watters continue to 'hold up' long after the 5 watters have dropped into the noise.

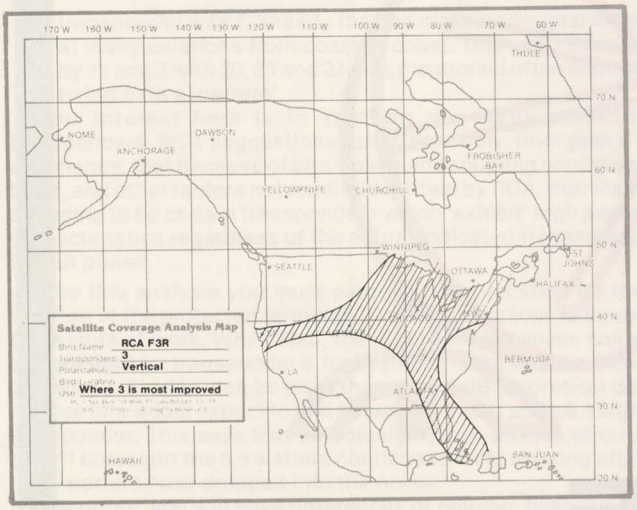
Therefore, you will have differences of opinion, based upon the location of the receive terminal, as to which transponders 'appear to be' acting like higher power units. Even the characteristics of the individual terminals enter into this. If a terminal has an LNA that is hot on the 'high end', coupled to a receiver that is 'hot' on the high end, coupled to a feed that is 'hot on the high end', the end result will be a system that **indicates** the higher end transponders (such as 18-20 upwards) are exhibiting 'high power' **characteristics.** A fellow who happens to have everything 'peaked' (by accident or on purpose) on the low end, next door, could have exactly opposite indicated results.

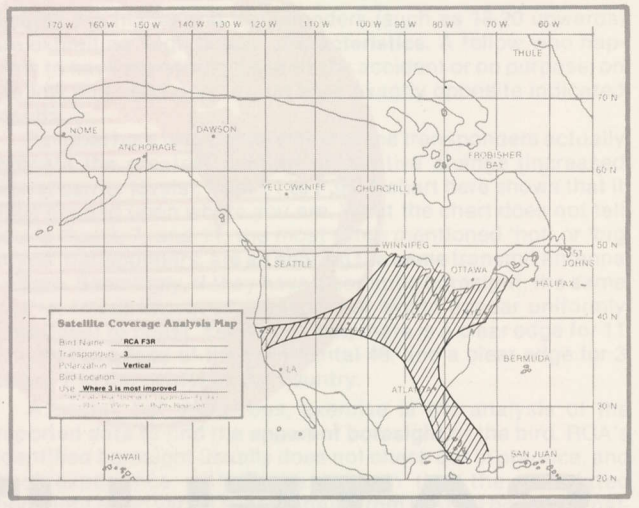
Our goal here is to define which of the transponders actually indicate the greatest amount of positive change (increased signal/carrier levels); from F1 to F3R. A chart here shows that it does depend upon where you are. What the chart does not tell you is that 3, 7, and 11, the most often mentioned 'hot' or 'big signal' transponders, are all sharing the **same** transmit antenna pattern. Seemingly, if they have a common boresight, the same 'hot' or 'most improved' transponder would appear uniformly from coast to coast. Yet it does **not;** there is a clear edge for 11 around the **edges** of the continental 48, and a clear edge for 3 and/or 7 in the **center** of the country.

A useful, but dangerous, exercise is the analysis of the reported data to find the **apparent boresight** of the bird. RCA's identified boresight usually does not check out in practice, and past experience with F1 has shown that the calculated boresight often varies substantially from the real boresight pattern found on the ground. Using the data from observations, we find some anamolies in the apparent real world boresights. We have mapped it here for you.

Horizontal set one (transponders 2, 6, 10 etc.) would appear to be centered in the Colorado or Nebraska area; slightly further west and perhaps north of the F1 boresight. Horizontal set 2

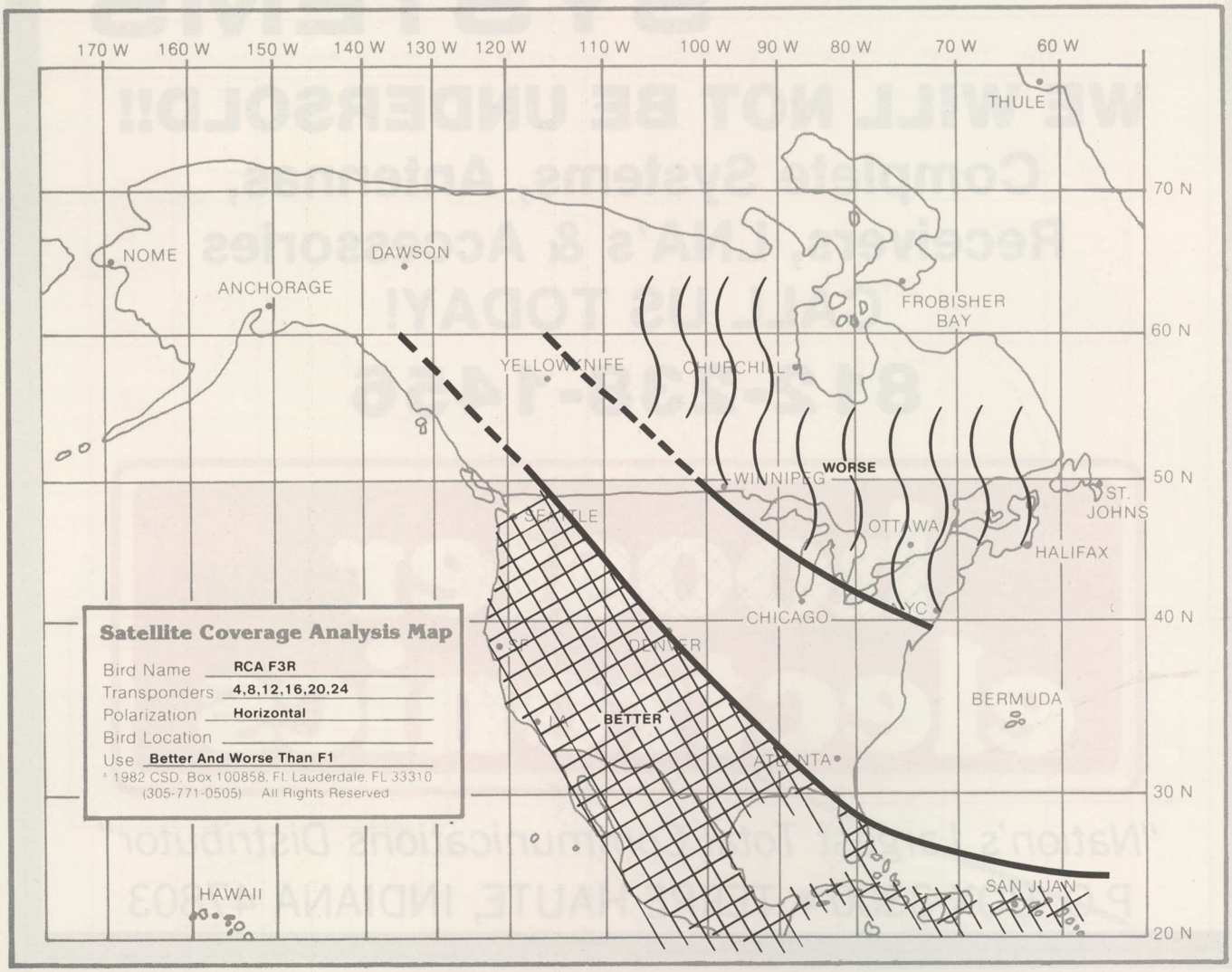


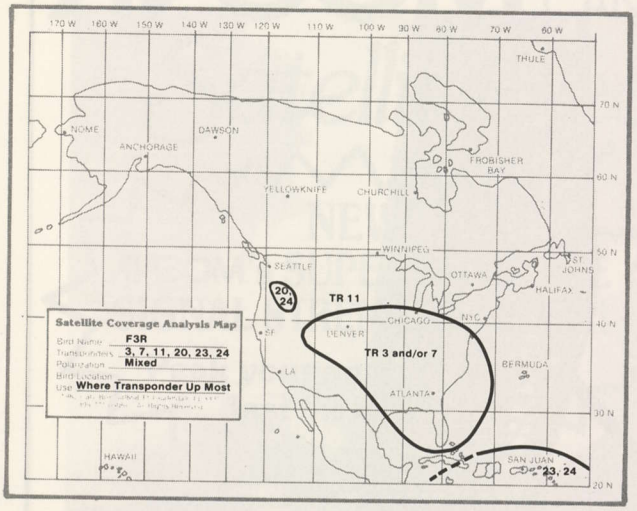


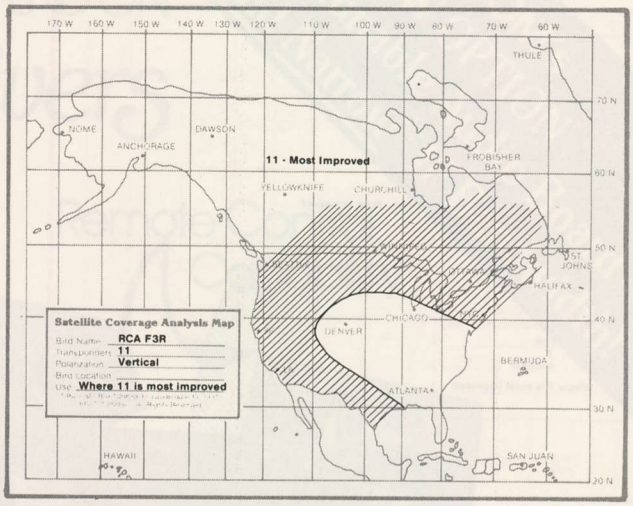


(transponders 4, 8, 12 etc.) is a strange one. Based upon measured CNR's at several points, the signals on this antenna set are actually stronger in the Rockey Mountain area (indicated), and nearly to the Texas coast (indicated), than they are half way in between the two. This shows up with stronger-than-expected signal levels into the northwest and far to the southeast, as far as the US Virgin Islands; and perhaps further out yet.

Vertical set one (transponders 1, 5, 9 etc.) appears to have a virtual boresight someplace in the Oklahoma area, while vertical set 2 (transponders 3, 7, 11 etc.) is further east, over approximately Tennessee.



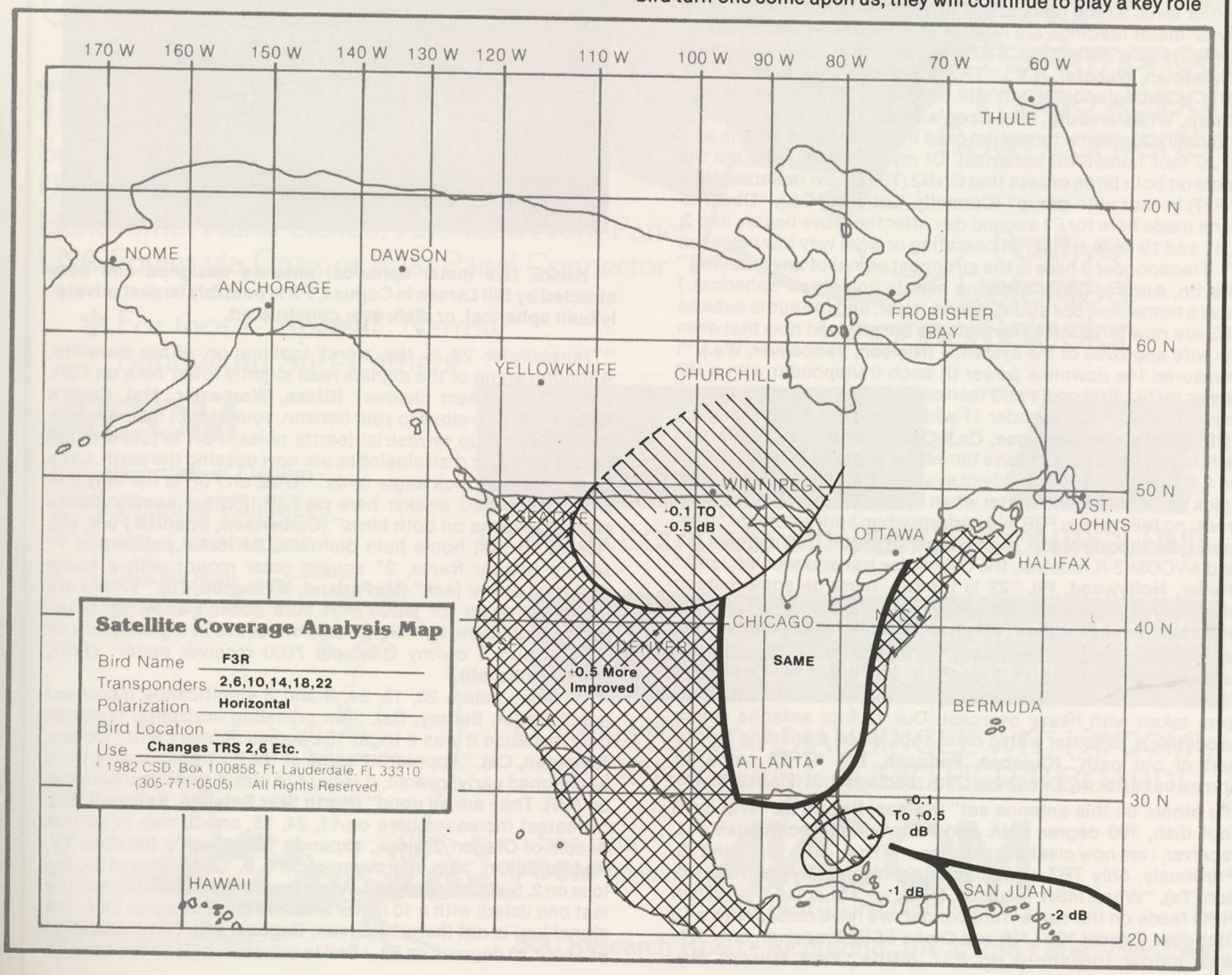


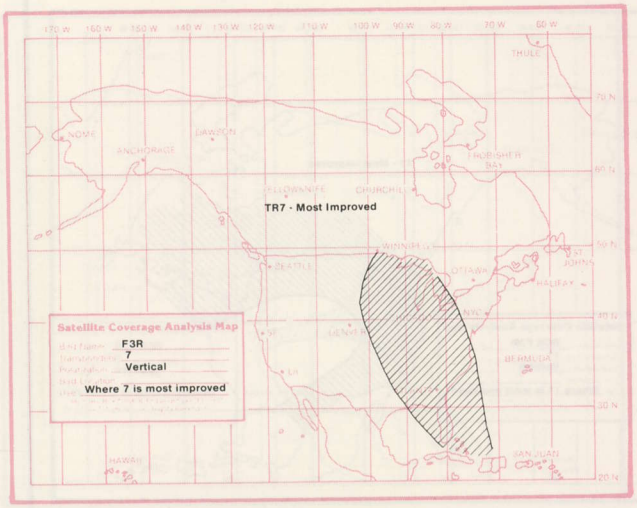


Can a set of EIRP contours be drawn? Probably not with accuracy, yet. And it may well be that four contour maps (one per antenna set) will no longer be adequate, with the addition of 8.5 watt transponders, and, the apparent appearence of split-pattern boresighting on at least one of the horizontal antenna sets.

SOAPBOX

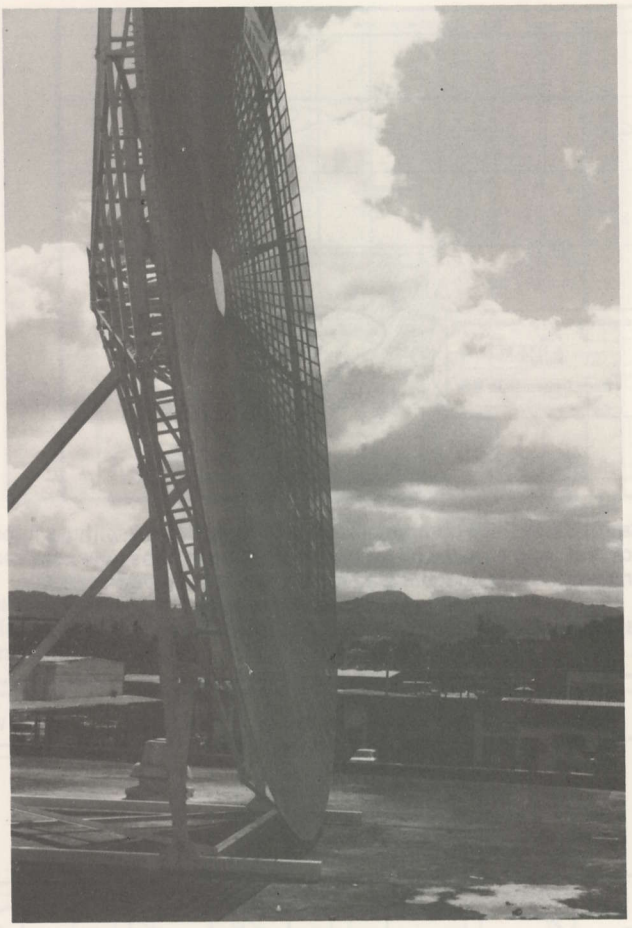
Observer comments often carry the 'nuggets' of data which make wading through an analysis such as this really worthwhile. The observations submitted by **CSD** readers form the main ingredient for any analysis of this type, and as future new bird turn-ons come upon us, they will continue to play a key role





in developing industry-wide data to be shared, used, and enjoyed by all of the participants.

"Really great reception! The improvements on transponders 3, 5, 6 and 16 were especially noticed here" **(Bawcom, Montrose, Ark.).** "All transponders but 22 look very good here, now. 22 lost carrier level, all the rest gained" **(Saporito, Warren, Pa.).** "All of my 'S' meter readings are relative with the meter turned 'down' for full scale deflection. TR22 is poor here, with sparklies" **(Christman, Webster, N.Y.).** "TR2 was good on F1, poor on F3R. TR11 is strong enough, but still poor here. TR22 is very noisy" **(Sharp, Wheelersburg, Oh.) Coop's Note:** Your 11 sounds as if you may have some terrestrial crud in it! "Antenna here is a 15 by 20 foot homebrew spherical. Of my six 'best', they are the same on both birds except that CNN2 (TR15) now replaces WOR (TR17) in that elite group" **(Connolly, Littleton, Co.).** "Observations made here for F1 second day after the move began, and 2, 8, 11 and 19 were either not operating or were very low power on F1. Transponder 3 here is the strongest signal of **any** satellite!" **(Martin, Aurora, Co.).** "Antenna here is homebrew spherical. I have a homebrew 564 audio demodulator, and the audio subs on TR3 are now fantastic! The pictures are so good now that even my wife approves of the system!" **(Nielsen, Vancouver, Wa.).** "I measured the downlink power of each transponder with a HP power meter, first on F1 and then on F3R. The greatest improvement here was transponder 11 which came up a whopping 5.8 dB!" **(Gustafson, San Jose, Ca.). Coop's Note:** See Gustafson tally in box form here. "I have terrestrial microwave interference on 4, 7, 8, 16, and 19 so could not evaluate the service there. Also, I pick up F1 only in the winter when the leaves are gone from the trees; no telling how F3R will perform when spring comes!" **(Diamond, Baltimore, Md.).** "With a Hero 16 footer, 100 degree LNA and AVCOM 3-R receiver, the only noisy transponder left is 22" **(Heller, Hollywood, Fl).** "22 is terrible, must be some reason other than bird change over. My 11 is only bad some of the time, so it must be their uplink" **(Styers, Farmville, NC). Coop's Note:** More likely your 11 problem is terrestrial. "Biggest improvements here were 11, 3 and 9, in that order. My December 18th F1 checks had higher levels, as the 26 December readings were taken with heavy overcast. Our 13 foot antenna works about like a 10 footer with a clear shot, since a building blocks part of our path" **(Cumbee, Paducah, Ky).** "TR22 came up somewhat after my December 29th readings, but it is still below the others on this antenna set" **(Nelson, Itasca, Il).** "With an 8 foot dish, 100 degree LNA and Automation Techniques PLL receiver, I am now clear of sparklies on TRs 4, 7, 11, 12, 13 and 20. Previously, only TR7 was completely clean" **(Mysza, Richardson, Tx).** "When MSN feeds on TR22, we are noise free. When HBO feeds on the same transponder, we have noise. With a 12 foot dish, Dexcel 120 LNA and Drake ESR24 receiver, only TR3 was below threshold on F1" **(Mills, Port Huron, Mi).**



HUGE 10.6 meter spherical antenna designed and constructed by Bill Larsen in Caguas, PR is possibly largest privately built spherical, or dish, ever constructed.

"Transponder 22 is the worst looking on either satellite. Although some of the signals read slightly lower here on F3R, the pictures seem cleaner" **(Glass, Worcester, Ma). Coop's Note:** F1 was so close to your horizon, your 11 foot dish was probably picking up terrestrial (earth) noise. F3R is just enough higher that your dish sidelobes are now missing the earth. Let's hear it for high look angle birds! "TR22 on F3R is the only one which measured weaker here on F3R. Picture quality seems about the same on both birds" **(Culbertson, Spanish Fork, Ut).** "Use a 15 foot home built dish with 24 metal petals and 1" square tubular frame, 2" square polar mount with a home designed power jack" **(McFarland, Millington, Tn).** "Where are those 8.5 watts for HBO??? It sure doesn't show up here" **(Rains, Robinson, Il).** "Significant increases in signal levels on TRs 11 and 3 on my Gillaspie 7600 receiver meter" **(Fritz, Lumbertville, Mi).**

"Transponders 20, 13, 24, 8 and 3 significantly increased here" **(Zoller, Burney, Ca).** "Am providing horizontal readings only, because it was a frigid 15 degrees January 8th!" **(Jones, Blairsden, Ca).** "Apparently some of the F1 transponders were abandoned early; overall, it is hard to pick a 'best' transponder on F3R. They are all good" **(North Star Satellite, Kalispell, Mt).** "Greatest increases here on 11, 24, 15, and 3; dish is portble Avcom-of-Oregon 2 piece, expando 10'" **(Cecil's Satellite TV, Redmond, Or).** "Big improvement on 1, 9, 13, 17, 21 and 24; big loss on 2, 6, 10, 14, 18 and 22. When you cannot clear up a set (the last one listed) with a 10 meter antenna and 75 degree LNA, the signal just is not there!" **(Larsen, Caguas, PR).** "With elevation at about 20 degrees on F1, I had to cut down quite a few trees to

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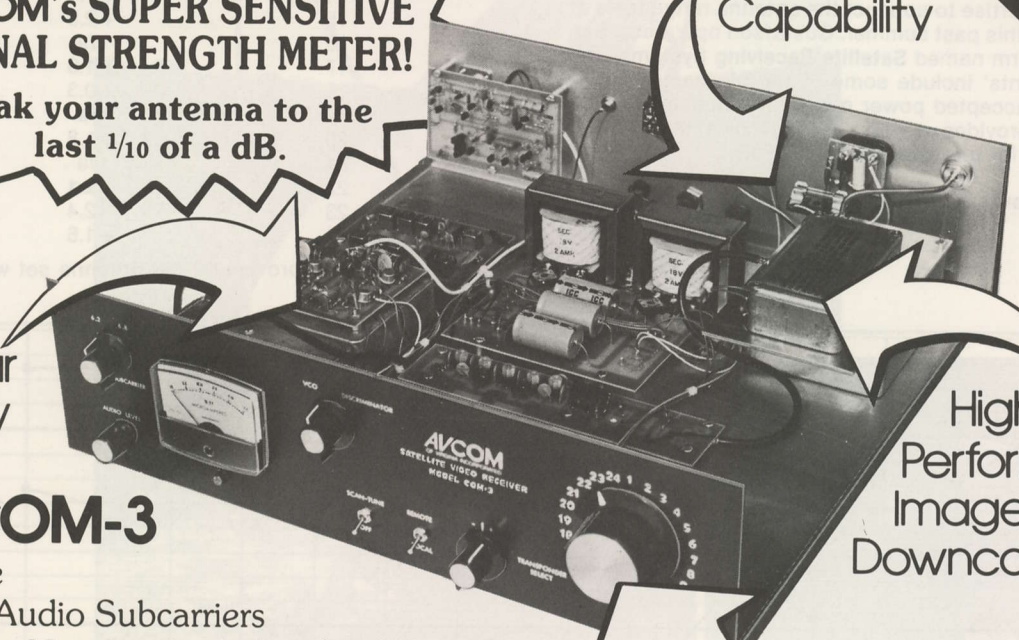

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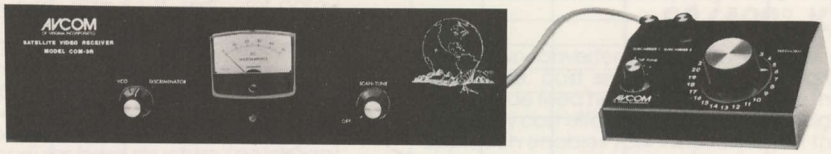

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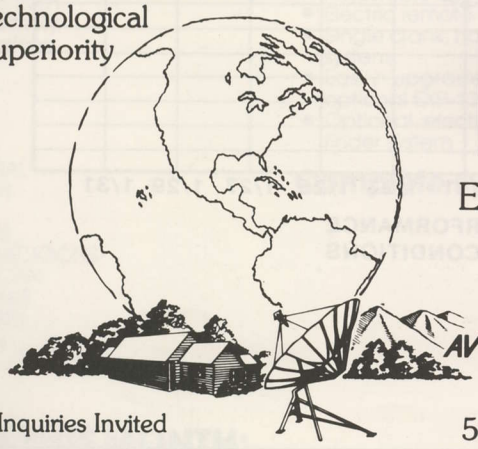

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get a clean shot. The signal improvement here on F3R is tremendous!" **(Plyler, Gastonia, NC).**

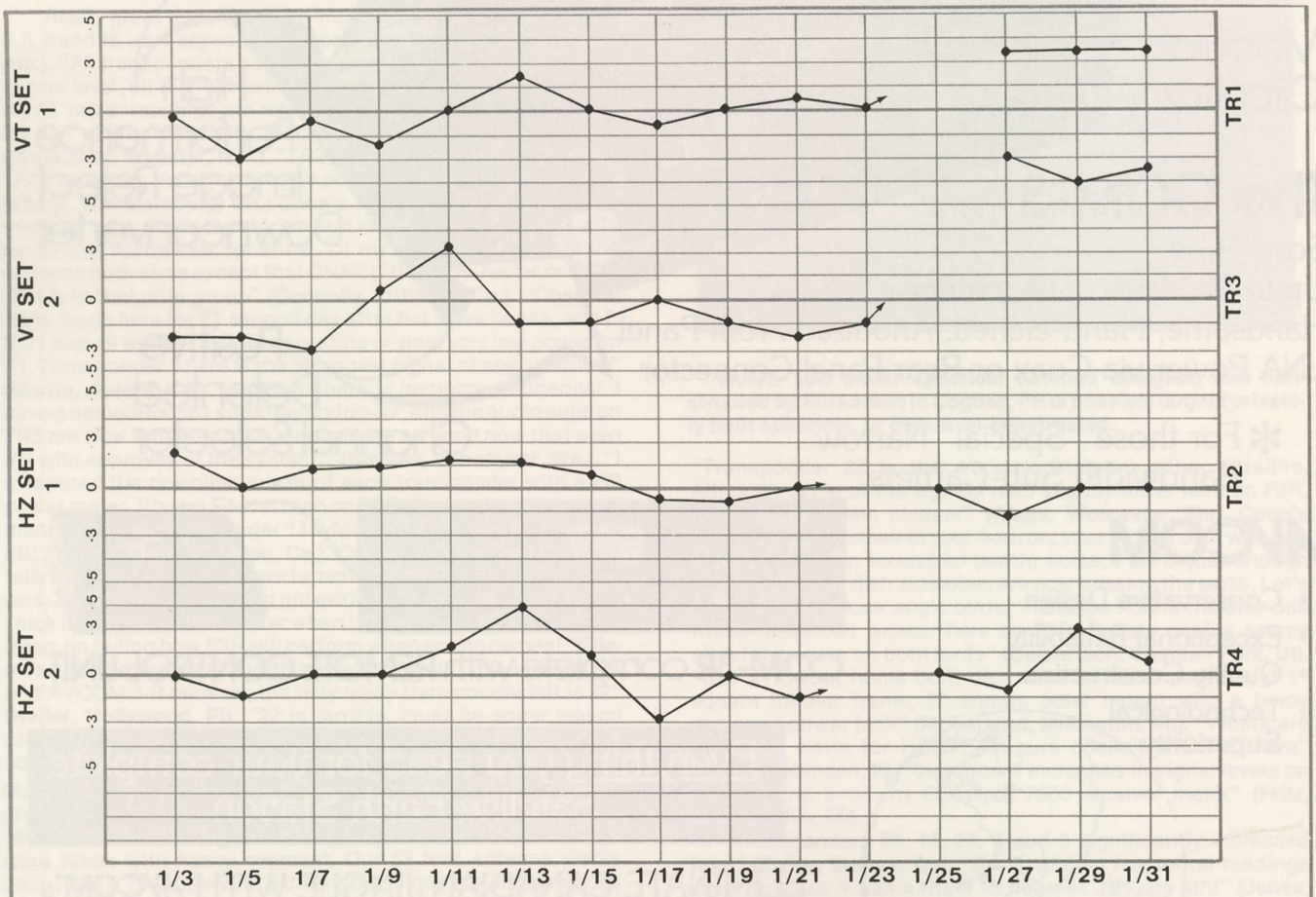
"F3R is about 2 dB hotter into southeastern Alaska than F1 was. We can now get good pictures with just a 12 foot dish here!" **(Yoshimi, Yakutat, Ak).** "CNN2 is the best by far here" **(Grine, Tampa, Fl).** "Improvements were 13, 14, 17 and 20" **(Gardner, Gainesville, Va.).**

GUSTAFSON Readings

Mike Gustafson is half of the duo who created the technical hardware and expertise to conduct the antenna range tests at the Omaha SPTS this past summer. Gustafson operates a San Jose, California firm named **Satellite Receiving Systems**, and his list of 'accounts' include some of the big names in the business. Using accepted power meter measurement techniques, Gustafson provides us with a critical look at the dB of actual improvement for transponders; F1 to F3R.

Transponder	**dB Improvement** (F3R over F1)
1	+2.1
2	+0.9
3	+4.2
4	n/a
5	+2.8
6	+1.5
7	+1.9
8	+2.9
9	+2.2
10	+1.0
11	+5.8
12	+1.4
13	+2.0
14	+1.5
15	+2.9
16	n/a
17	+1.9
18	+0.3
19	n/a
20	+1.8
21	n/a
22	**−2.1**
23	+2.4
24	+1.6

The **average** improvement per antenna set works out this



JANUARY 1982 / F3R STABILITY PERFORMANCE AT 72 W, 22 N. UNDER CLEAR SKY CONDITIONS

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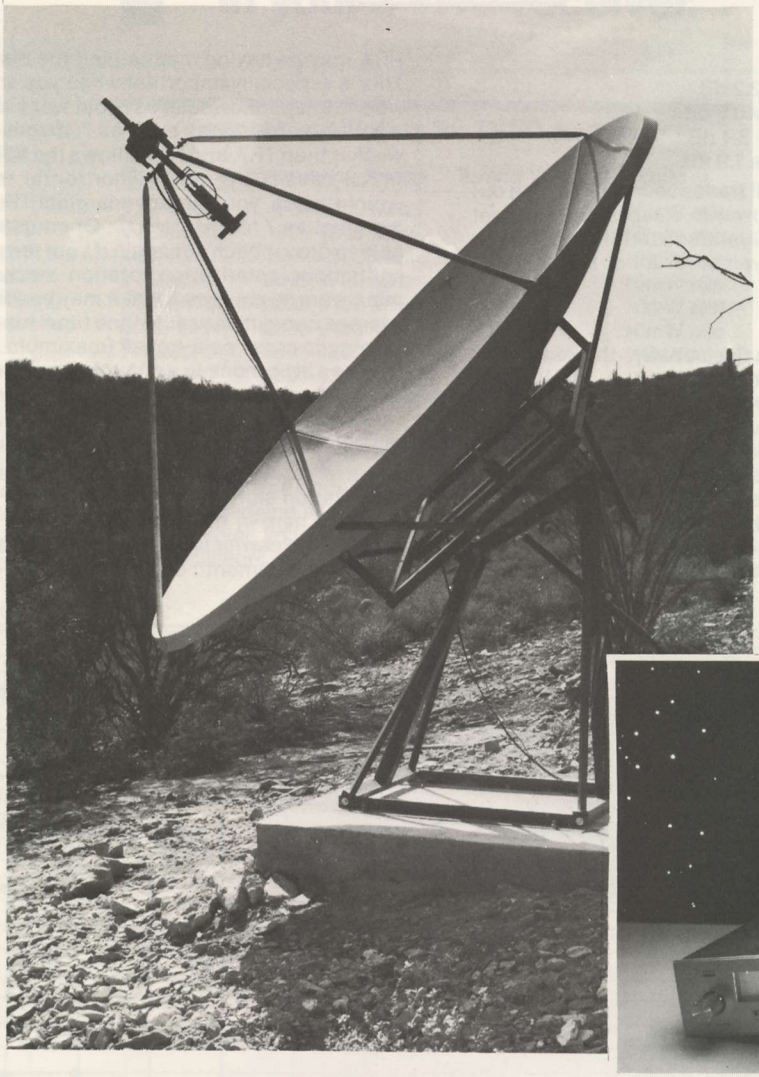

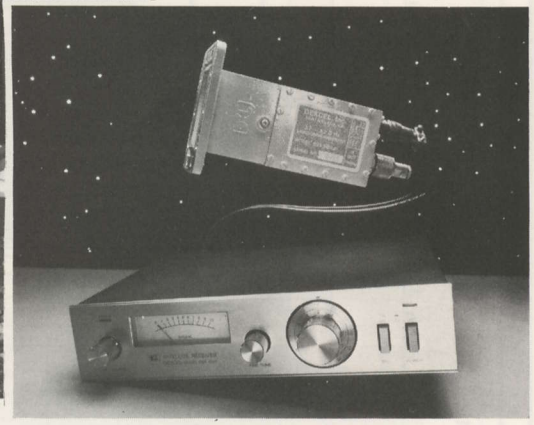

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The average improvement for all transponders, throwing out the highest and lowest, is 2.0 dB upwards. Keep in mind this set of numbers is relevent only at the Gustafson terminal; although it should be very close to being typical for all of the northern California region.

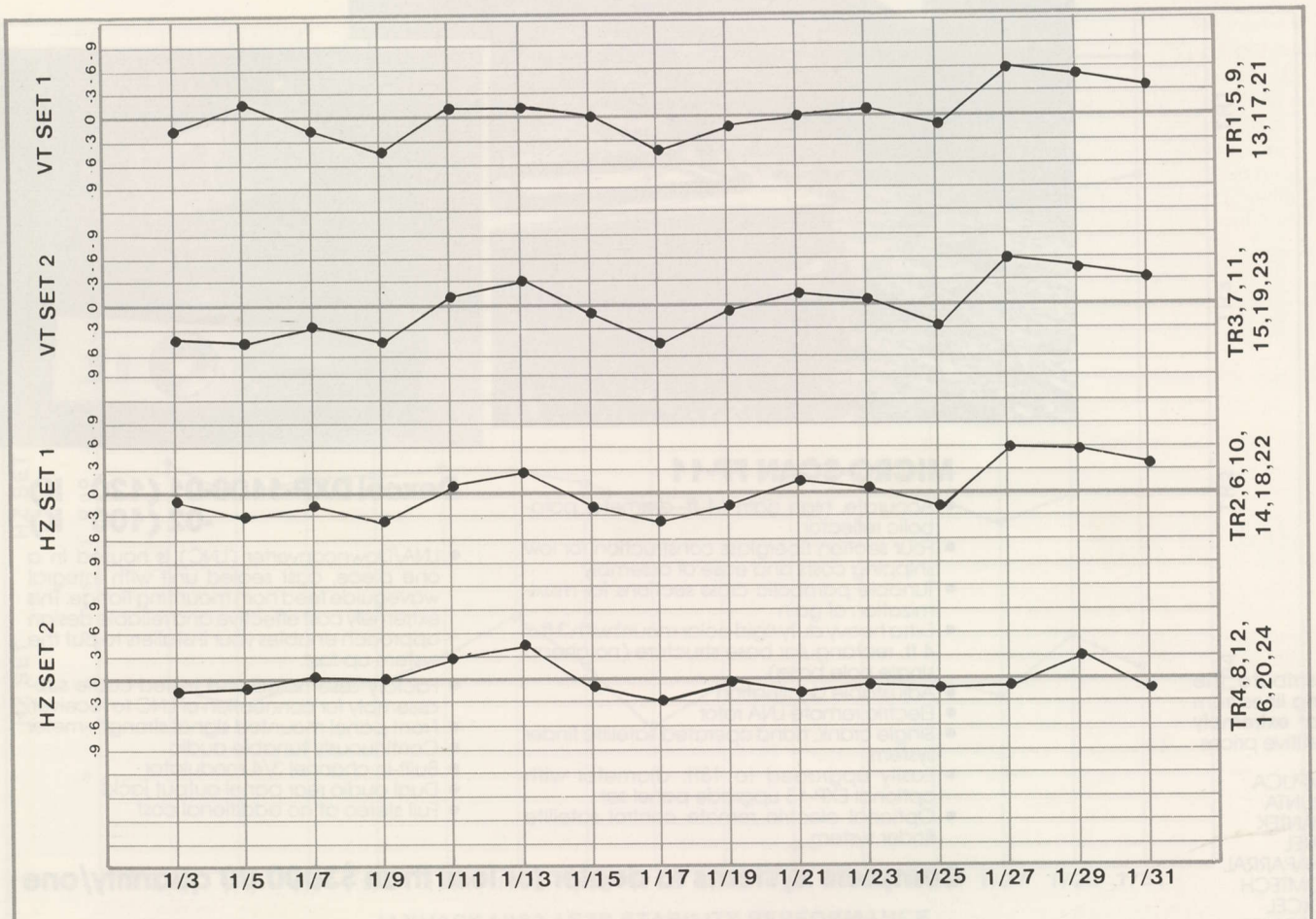
HOW STABLE is F3R?

The transponder 22 problem aside, briefly, the long term stability of F3R becomes the paramount question. RCA wants this bird to last for ten years. They will probably settle for seven. In either case, you are going to have 131 west on your antenna position indicator for a long time to come.

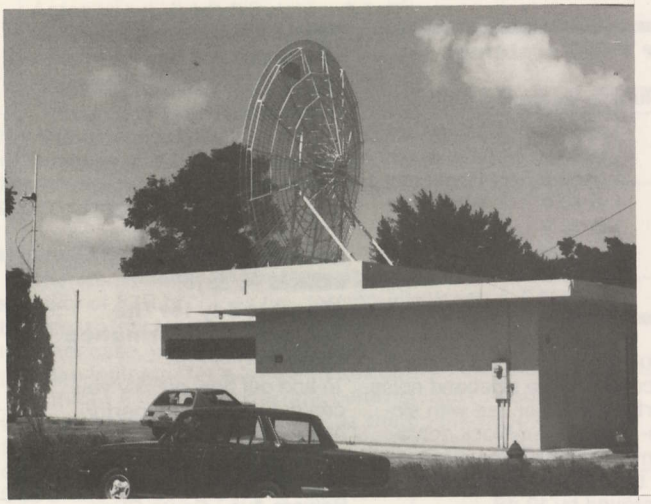
Initially, F3R exhibited erratic behavior. Not to worry, most of that seems to have gone away as the uplink people and the flight control personnel sorted out the newness of F3R. But not all of the problems have resolved themselves, as of this report. One of the curious problems reported is the apparent difficulty RCA may be having maintaining the bird's polarization 'skew'. This is especially important when you are trying to yank a fairly weak transponder (such as 6) out from inside of or along side of a potent transponder; such as 7. If your TR6 carrier is 3 to 5 dB weaker than TR7, and RCA **allows** the F3R bird to rotate slightly, which causes the vertical/horizontal relationship to twist at your location, your already-marginal TR6 signal becomes **more marginal** as 7 'crawls' into 6. Of course you could, or may, be able to drop it back out again if your terminal is equipped with a continuous polarization rotation mechanism. But not all terminals are so equipped, and it may be a little much to expect the average consumer-user to 'fine tune' his polarization control for 'minimum cross pole signal' (maximum cross pole isolation). It may be a little much to expect the average **anyone** to do that on a regular basis.

This problem is reported most often by observers off on the edges of the pattern. It will bear watching, since nobody wants to have to keep on worrying about, and compensating for, polarization shifting.

Down here in the Turks and Caicos we set out to carefully monitor the carrier levels on all of the transponders for the first full (calendar) month of operation. Two charts here show what



JANUARY, F3R / SUM AND AVERAGE OF ALL TRANSPONDERS ON EACH OF FOUR ANTENNA SETS AT 72 W, 22 N UNDER CLEAR SKY CONDITIONS



FEED for Larsen 10.6 meter spherical is barely visible on post at left hand edge of photo.

we found.

If you take, arbitrarily, one transponder from each antenna set (we took TRs 1, 2, 3 and 4 because they were the lowest, and first, in each set) and chart the carrier level variations, you can see the results of a month of service. What this does **not** really tell you is the performance of the bird; the variations could be **(1)** weather at the receiving site (they were not; we did the measurements only in clear sky situations), **(2)** individual uplink variations (not everyone saturates their transponder to full power output all of the time), or even the transponder itself. Still, there are clearly seen patterns, and you can make of them what you will.

A better approach is to look at the sum of the digits; that is, take the carrier level readings for **all** of the transponders on a given antenna set and sum them. Sum them for the whole reporting/recording period, and divide by the number of days (i.e. observations). Then go back and sum the readings for each individual day, and compare the average of that smaller number to the average of the bigger number. We did that, and the results are shown here. Now we are 'washing out' the individual transponder problems, if any, and looking at the four antenna sets and the transponders they serve as distinct units in time.

Now the variations appear very similar in nature, tracking from set to set with close similarity. Three of the four curves could be laid atop one another; the fourth, horizontal set 2 (TRs 4, 8, 12 etc.) does show an anamoly near the end of the month; but not serious.

Finally the observations of individual transponder variations, at our test site in the Caribbean. Here we find some rather large numbers at play.

Variations Greater than 3 dB
ESPN / transponder 7
Variations Greater Than 2 dB
WGN / transponder 3
MTV / transponder 11
CNN/2 / transponder 15

It is worth noting that **three** of these four initial 'variable' transponders **are those which** continent wide reporters tag with 'strongest in level' classifications.

Variations Greater Than 1 dB
Nickelodeon / transponder 1
CBN / transponder 8
USA / transponder 9
Showtime east / transponder 12
HBO west / transponder 13
MSN / transponder 22

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Cinemax west / transponder 23
HBO east / transponder 24
Variations Less Than 1 dB
PTL / transponder 2
The Movie Channel / transponder 5
WTBS / transponder 6
Showtime west / transponder 10
CNN / transponder 14
Various / transponder 16
WOR / transponder 17
Reuters / GalaVision / transponder 18
Cinemax east / transponder 20
HTN / transponder 21

The three **most stable** signals, through F3R, are easy to select; transponders 6, 14 and 21 all stayed within 0.2 dB of their nominal levels during the full month. It is probably not a coincidence that all three uplink from the same (near Atlanta) location operated by Southern Satellite Systems.

INDUSTRY AT LARGE

CORRESPONDENCE, NOTES, REBUTTALS AND CHARGES . . .

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HELP NEEDED

Our office is investigating the murder of Dr. Marc W. McCornack, who was an enthusiast for private satellite reception at the time of his death. The record shows the following. On Feb ruary 27, 1980 Dr. McCornack's wife received a telephone call from a man who identified himself only as 'Bergstrom'. The wife relayed the call to Dr. McCornack who told her 'I know that guy; he is the guy from the satellite antenna company. I have an appointment to see a system with him . If he calls, or comes by, tell him I'll be a little late'.

Dr. McCornack returned home that day at about 3:45 PM, and was followed into the driveway by a man believed to be Bergstrom. **The Bergstrom description is as follows:** white, Caucasian male, 5'8", medium build, wide shoulders, narrow hips, styled brown hair, wearing a grey suit and trousers similar to a mechanic's uniform, and a wide black belt. His vehicle was

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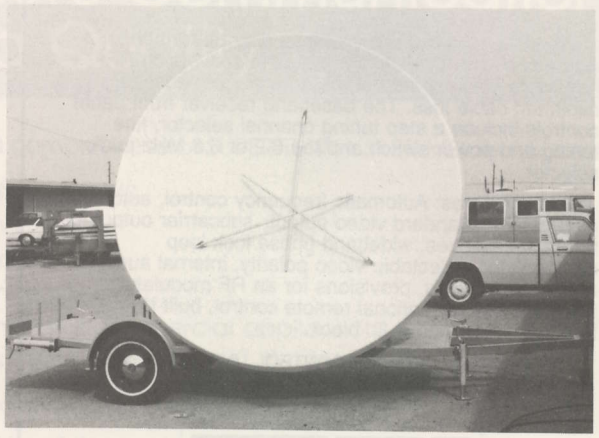

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described as a large, black sedan with a broad expanse of glass, bearing a California license plate beginning with the letter 'O' or the number '0'. Investigators believe the vehicle to be similar to a mid-50's Cadillac, Buick or Oldsmobile.

Dr. Mac was never seen nor heard from again. His body was found March 1st (1980) in an isolated desert area of western Imperial County. To date, three individuals named Bergstrom have been located and eliminated as suspects. Each had some sort of 'tie' to Dr. Mac, in some manner, but none had any background in the field of communications.

Dr. McCornack had little patience with 'phonies' and 'hucketers', and we believe Bergstrom must have demonstrated a wide and accurate range of knowledge of satellite antennas; (or Dr. Mac would have never spent any time with him). Whether 'Bergstrom' was simply well-read in the field, or actually involved, is conjecture.

If anyone in the industry can provide any leads or information to help us solve this murder, it would be most appreciated. Information should be forwarded to: **Investigations Division,** Imperial County Sheriff's Office, 328 Applestill Road, El Centro, Ca. 92243; (714/339-6311).

Oren R. Fox
Sheriff-Coroner-Marshall
Imperial County, California

We remember Dr. Mac. He attended the first SPTS in Oklahoma City and towards the end of the event we asked him what his interest in the field was. "First, to get my own terminal operational. After that, there may be a business here." **"Shortly after the murder investigation began, the San Diego authorities contacted STT to ask us to go through our files looking for anyone named Bergstrom who had ever ordered satellite materials from STT. We did, and sent the data on to the authorities. Two years later the case remains unsolved. There weren't very many people who could spell satellite in the spring of '80. We suggest you set the** 'name' **of Bergstrom** aside **and try to fit the description of the person and vehicle to someone who might have been nipping around the fringes of the young industry late in the winter of 1980. If anything jells in your mind, contact the folks in El Centro with your information.**

COOLING ET AL

People in Oklahoma cannot appreciate the problems we along the east coast have with weak signals (on F1). Before F3R was launched, I already had my control programmed for 131 west. When they started transmitting, I was right on the button with my light indicator. My drive motor thrust equals 1″ of movement for 4 degrees, and it takes about 4 seconds to move to an adjacent (4 degree spaced) bird. I can program in 18 satellites from my antenna position lock down, so when I learn the azimuth heading for a new satellite, I set my microswitch and push a button, and there it is! My system consists of a 10′ dish, a 52 dB gain LNA with 80 feet of ½ inch Heliax and a Comtech model RCV-550 receiver. I started following all of this before the first Oklahoma SPTS, having gotten hooked through Coop's series in **Radio Electronics** back in 1979. I started to build the Howard terminal receiver, but at the time the Manual first came out the parts were nearly impossible to find so I dropped the idea. This past summer I decided to go ahead and buy a commercial dish and receiver as I am a perfectionist when it comes to television reception.

My dish was supposed to have a tracking polar mount. After I built and installed the azimuth motors and remote control, I found that from Comstar D2 to Satcom F1 I had to raise the elevation about 3/8″ on F1 for peak reception. So I added an elevation motor with a remote control. My receiver brings out a MGC (manual gain control) voltage which I have now remoted to my easy chair. This allows me to pinpoint each bird with the remote motor drive switching. Anyone who puts in a dish and does not make provision to move it by motor control, remotely, is certainly missing a lot of the fun of reception.

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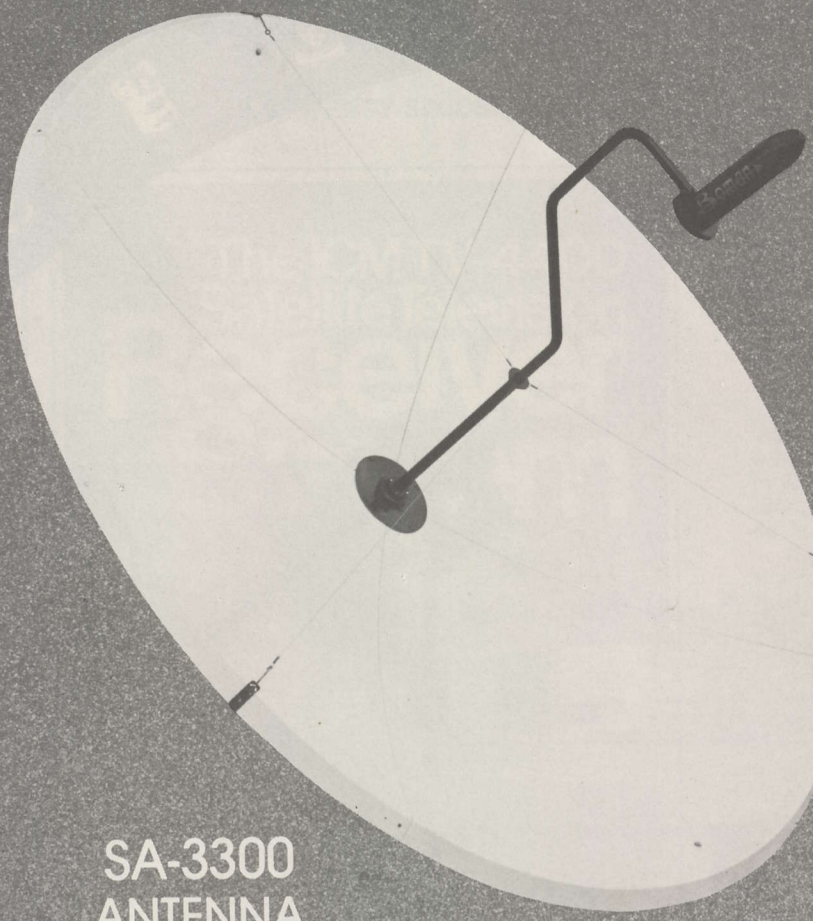

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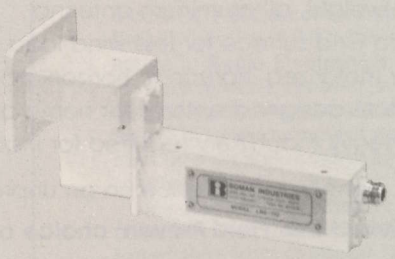
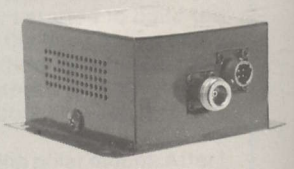


DOWN CONVERTERS



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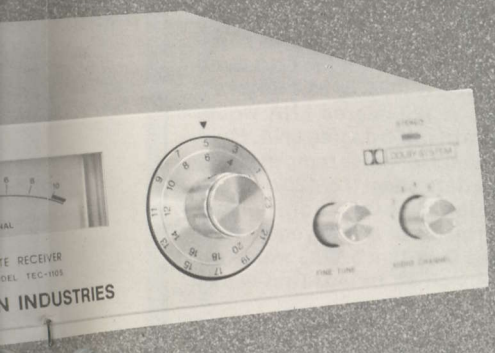

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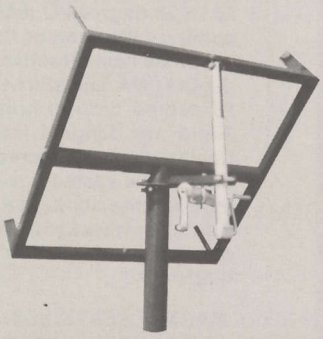
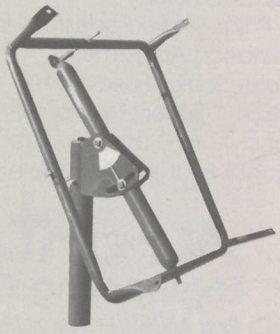


POLAR MOUNT



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My next project is to find someway to cool the LNA. I am knowledgeable about refrigeration systems and I think there is a way to use a small refrigerator evaporator inside my LNA covering shell, and then insulating the shell (my LNA is enclosed in an 8 inch cylinder). I believe it is possible to lower the temperature, around the LNA, to approximately -30 C, which should improve my noise temperature as well as increase the LNA gain. What do you think of this idea?

Bill Plyler
Plyler Electronics & TV
1629 Plyler Lake Road
Gastonia, NC 28052

Cooling the LNA is a subject that has challenged, and intrigued, system designers for years. The pros do it at the Intelsat terminal level but nobody has ever developed an effective, reasonably priced technique for doing it at the private terminal level. Here are the facts. If you can reduce the ambient operating temperature of the LNA GaAs-Fet transistors 1 degree C, **there will be an attendent drop of** 0.5285 **in noise temperature. To keep it simple, if you could lower the LNA temp from 40 C to 0 C, you would pick up 40 x 0.5285, or 21.4 degrees, in noise temperature performance. A 120 degree LNA would have the effective noise temperature of a 100 degree LNA. Most of the LNA suppliers now rate their units for noise temp at about** 28 degrees C. **So if you believe their data sheet** (i.e. 120 degrees K), **you are believing their number for 28 C. On a hot, summer day, it can well reach 40 C** (or more) **inside of an LNA enclosure. So you are, at that time, 12 degrees C or 12 x 0.5285 worse off than the original manufacturer's specified rating. That works out to just over 6 degrees K.**

Let's see what cooling really buys you. **A reasonable range of temperatures to work in is from – 30 C to + 40 C. You might reach – 30 C with a cooling system that would be cost effective on a private terminal. If we remember that the LNA specifications typically are at + 28C, that means we can hope to achieve a 58 C improvement** (i.e. better than the manufacturer's rated noise temp) **at – 30 C. And using the conversion number, that is 58 x 0.5285, or 30.65 degrees K improvement. Which would make a 120 unit function as if it were a 90** (89) **degree unit. There are many who swear that the typical installation cannot** 'see' **the difference between a 120 and a 100 degree LNA. We would agree,** except **where the bulk of the transponders are at or below threshold.** THEN, **you can see it. If the signals are all good** (i.e. above threshold), **it is probably true that you cannot see it. You might feel that you can do better than – 30 C with a cooling unit. Perhaps, but at what cost? You are not really cooling, you are** extracting **heat. And there is a significant difference when it comes to cost of 'cooling' versus, 'extracting heat'. The analysis you have to make is how much will it cost you to lower the internal ambient temperature of the LNA to – 30 C, and how does that cost** compare **with simply purchasing a lower noise temperature LNA in the first place? If you can count on getting 20 to 25 degrees C real world drop, compare what the cost of cooling will be versus the next lower step of LNA. Where it really becomes cost effective is in the situation where you have an 85 degree LNA, and still need improved performance. There, a 20 to 25 degree drop in noise temp becomes a significant factor. There are dangers involved. Transistors** (GaAs-FETs in particular) **do have increased gain when the temperature goes down. Few systems really suffer from too** little **LNA gain. You may find the additional gain will overload your receiver** (there's a cure), **or worse yet, the transistors may even 'run away' if their gain gets too high. You'll know when it happens. Everything will quit!**

MARKET SERVICES?

If anybody knows how to legally acquire some market news services, via satellite, other than Reuters, or WGN early farm reports, we would like to know about it! We live in farming country and if we could show the farmers how they could benefit from the terminal by getting fast, accurate market and com-

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modity reports, we feel it would help us to sell to the farmers. If they can show it was for their own education, it improves their ability to treat it for IRS deductions. Oh yes, I see that now **Sat Guide** is no longer accepting discount pricing, advertising. Enough of us wrote them about it; perhaps it does still help to write letters!

Earth Stations, Inc.
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You bet it helps to write letters. And editorials. And to chastize somebody for doing something that is dumb. NOW **-hopefully,** Sat Guide **will figure out a way to pick up the ANIK, PBS and other service feeds and include them in their listings.** Satellite TV Week **does it; so we know it can be done!** Sat Guide **will have a problem listing anything that is not carried by cable systems, however. Any such listings will obviously be intended for non-cable or** (LPTV) **readers and that will make it more difficult for** Sat Guide **to keep up the facade of being a cable/** (LPTV) **directed publication. Marketing data? The farm marketing area is underserved; and we agree there is an area here where up to date commodity reports would be a big help in selling terminals. For non-farm commodity areas, we recommend FNN** (Financial News Network) **on Westar 3, from 10 AM to 5 PM daily.**

USA VIDEO IN ISRAEL?

I enjoy reading **CSD** and find many of the articles quite fruitful. I am a correspondent with a chap in Jerusalem, Israel (latitude 31 north and longitude 35 east). He has a 16 foot dish, Microdyne receiver, Microwave Associates 100 degree LNA. And, he has been able to receive video signals from Intelsat 4 (F7) at 1 degree west, Statsionar 2 at 35 east and Symphonie 1 at 49 degrees east. We are providing him with a tunable audio system, and a circular polarized feed for his dish. I wonder if **CSD,** or readers, can provide some expertise that would help my correspondent receive additional satellites? Is there any chance of his seeing US programming (pay or commercial) from that location?

David M. Drucker
P.O. Box 255
Evergreen, Co. 80439

There is no way **a terminal in Israel can 'see' any of the birds located in geo-stationary** (Clarke) **orbit, serving North America. If you cannot 'see' it, there is no hope of receiving it; footprints aside. However, mere "line of sight" to the bird** (unobstructed) **is no guarantee that you will have reception since the bird may have its antenna(s) pointing away from you. That's basic. There is also a Symphonie bird at 11 west and a powerful Russian bird at 14 west, plus a cluster of Intelsat birds around 23-28 west. Converting to circular feed will help** (by 2 dB or more) **and having tunable audio will allow your friend to track down the many hidden audio sub-carriers.**

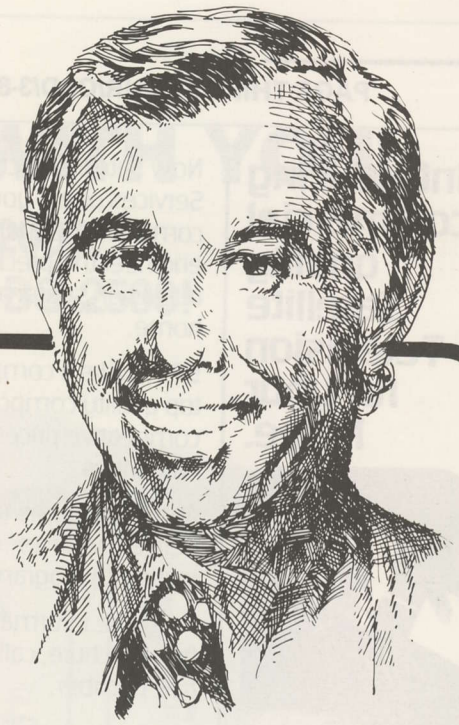
GIBSON MUSIC BOX PROBLEM(?)

I enjoyed reading the Gibson Music Box article in the November issue of **CSD,** but cannot say I enjoyed building it. To summarize my problems:

1) While Toronto is the largest city in Canada, finding data sheets on ICs is next to impossible. I would have appreciated a print-out of the RCA IC and Op-Amp with the article.
2) While RCA Canada is a large operation here, it has a branch plant mentality. RCA claimed to have no technical sheets on the PM-200 board or the XL-100 receiver (!).
3) What make of receiver was the Music Box hooked to? Can anyone help me make it play with a Sat-Tec receiver?
4) Are there any transponders on F1 (F3R) using composite stereo; that is, standard FM broadcast stereo with 19 kHz pilot tone and so on?

Gibson replies: the pin diagram for the TL084 is on the back of every bubble pack Radio Shack sells ... and Toronto has around 20 Radio Shack stores, according to their directory. "I

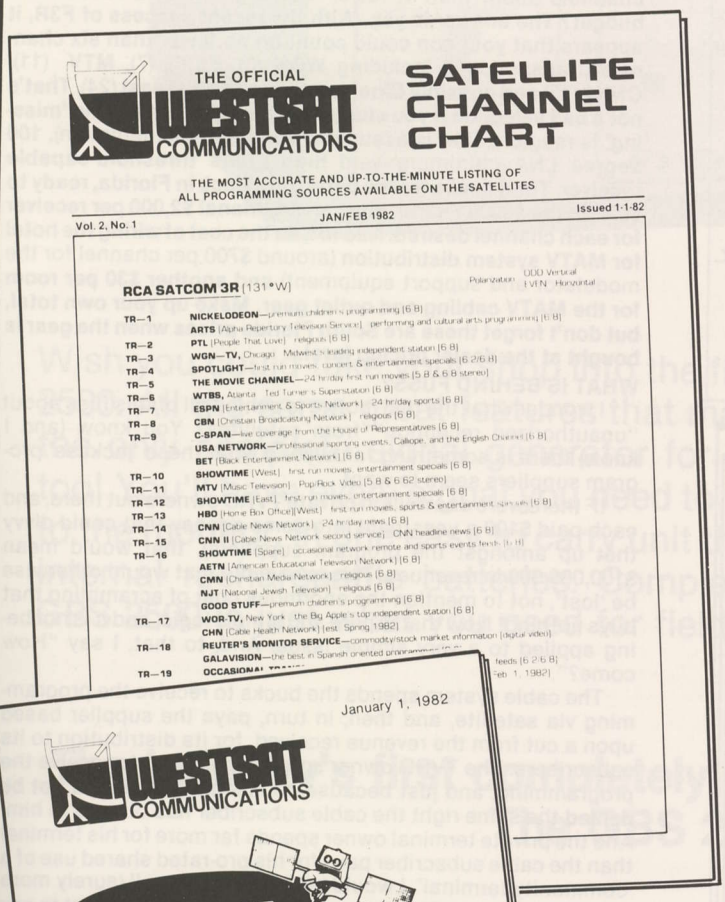
Johnny Carson, Where Are You?



Comstar 3, Transponder 1

Monday thru Friday

8:30	9:30	10:30	11:30
Pacific	Mountain	Central	Eastern



THE OFFICIAL WESTSAT COMMUNICATIONS SATELLITE CHANNEL CHART

THE MOST ACCURATE AND UP-TO-THE-MINUTE LISTING OF ALL PROGRAMMING SOURCES AVAILABLE ON THE SATELLITES

Vol. 2, No. 1 JAN/FEB 1982 Issued 1-1-82

RCA SATCOM 3R (131°W) Polarization: ODD Vertical / EVEN Horizontal

TR—1 NICKELODEON—premium children's programming [6 8]
ARTS [Alpha Repertory Television Service] performing and cultural arts programming [6 8]
TR—2 PTL [People That Love] religious [6 8]
TR—3 WGN—TV, Chicago Midwest's leading independent station [6 8]
TR—4 SPOTLIGHT—first run movies, concert & entertainment specials [6 2/6 8]
TR—5 THE MOVIE CHANNEL—24 hr/day first run movies [5 8 & 6 8 stereo]
TR—6 WTBS, Atlanta Ted Turner's Superstation [6 8]
TR—7 ESPN [Entertainment & Sports Network] 24 hr/day sports [6 8]
TR—8 CBN [Christian Broadcasting Network] religious [6 8]
TR—9 C-SPAN—live coverage from the House of Representatives [6 8]
USA NETWORK—professional sporting events, Calliope, and the English Channel [6 8]
BET [Black Entertainment Network] [6 8]
TR—10 SHOWTIME [West] first run movies, entertainment specials [6 8]
TR—11 MTV [Music Television] Pop/Rock Video [5 8 & 6 8/2 stereo]
TR—12 SHOWTIME [East] first run movies, entertainment specials [6 8]
TR—13 HBO [Home Box Office][West] first run movies, sports & entertainment specials [6 8]
TR—14 CNN [Cable News Network] 24 hr/day news [6 8]
TR—15 CNN II [Cable News Network second service] CNN headline news [6 8]
TR—16 SHOWTIME [Spare] occasional network remote and sports events feeds [6 8]
AETN [American Educational Television Network] [6 8]
CMN [Christian Media Network] religious [6 8]
NJT [National Jewish Television] religious [6 8]
GOOD STUFF—premium children's programming [6 8]
TR—17 WOR-TV, New York the Big Apple's top independent station [6 8]
CHN [Cable Health Network] [est. Spring 1982]
TR—18 REUTER'S MONITOR SERVICE—commodity/stock market information [digital video]
GALAVISION—the best in Spanish oriented programming [6 2/6 8]
TR—19 OCCASIONAL TRANSPONDER feeds [6 2/6 8] [Feb. 1, 1982]

January 1, 1982

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am perhaps at fault for Mr. Lewis's problems because of my writing style. I have a tendency to try like the devil to make things sound easier than they may prove to be, depending of course on the level of technical proficiency of the reader!"

TVRO IN ANTIGUA?

My son is considering purchasing a resort on the Leeward Island of Antigua. He has asked me to determine the feasibility of installing an earth station at that location. Initially he wants a terminal for good reception to distribute to about sixty (hotel) rooms. Later on he may be interested in an uplink as well for the processing of telephone calls directly back to the states. Is there a suitable footprint into this eastern Caribbean location?

William C. Long
Box 151
Buellton, Ca. 93427

Your key word was "good" (reception). **Good enough to distribute via an in-house MATV system, on some number of channels** (more than 1, fewer than 24), **within a reasonable budget? The answer is yes. With the recent success of F3R, it appears that your son could count on no fewer than six channels** (transponders) **including WGN** (3), **ESPN** (7), **MTV** (11), **CNN2** (15) **and possibly Cinexmax** (20) **and HBO east** (24). **That's not a bad selection if you study it carefully; the only thing 'missing' is religion. That is assuming a 20 foot fish** (minimum), **100 degree LNA** (minimum) **and high grade threshold-capable receiver. Total bucks for the parts, on a dock in Florida, ready to ship; in the $9000 region, plus, an additional $2,000 per receiver for each channel desired. Add to that the cost of wiring the hotel for MATV system distribution** (around $700 per channel for the modulator and support equipment) **and another $30 per room for the MATV cabling and outlet gear. Make up your own total, but don't forget these are South Florida prices when the gear is bought at the dealer pricing level.**

WHAT IS BEHIND FUSS?

I wonder what the real motive is behind all of this fuss about "unauthorized reception" from satellites? You know (and I know) there is something far beyond what these 'jackass' program suppliers seem to want.

IF there were one million private TVRO owners out there, and each paid $100 a year (paid into some agency that could divvy that up amongst the program suppliers), that would mean $100,000,000 in revenues. This is revenue that would otherwise be 'lost', not to mention the enormous cost of scrambling that buys nothing! Now that is pure and simple logic, and it is not being applied to a very simple issue. And, to that, I say "How come?".

The cable system spends the bucks to receive the programming via satellite, and then, in turn, pays the supplier based upon a cut from the revenue received, for its distribution to its subscribers. The TVRO owner spends the bucks to receive the programming, and just because he is small, he should **not be denied** the same right the cable subscriber has offered to him. And the private terminal owner spends far more for his terminal than the cable subscriber pays for his pro-rated shared use of a 'community terminal'. I would bet that virtually all (surely more than 98%) of home TVRO terminal owners pose no threat to any existing 'services' in their areas.

The issue is so simple to solve. I am beginning to suspect ulterior motives on behalf of 'someone'. Maybe we should pose the question to some TVRO owners; Senator Barry Goldwater, for example! Since politicians are now involved in the ownership (and operation) of private terminals, let's ask a few what they believe should be done about this 'problem'.

I deny anyone the 'right' to scramble broadcast transmissions (unless they are transmissions by and for security-conscious government agencies or law enforcement agencies), and as far as I am concerned satellite transmissions are 'broadcast' in every sense of the word.

The benefits to the program suppliers are enormous, using satellites to circumvent the cost of land based distribution. However, as far as I am concerned, that is where their 'advantage' ends. For anyone to tell me that I cannot passively receive

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radio (television) transmissions in my own home, for my own private use, is a farce. I could believe that in the Soviet Union, but not here!

Oh yes, after reading two recent issues of **73 Magazine** I am beginning to suspect something. Is Coop, and Wayne, up to something?

James Beckett
27 Butler Park
Corning, New York 14830

Logic aside, perhaps the 'position' of the movie studio program suppliers will be easier to follow in the future if you keep this simple 'logic' in mind. Movie distribution firms trust nobody; not even each other. **The history of** that **industry is filled with back stabbing, underhanded dealings that make 'The Godfather' look tame. They regularily send 'ringers' into the field to 'count' the theater gate, as a cross-check on the 'reported gate' the theater operator 'turns in'. They** expect **everyone that has anything to do with their product** (from creator to distributor to viewer) **to** try **to 'cheat' them. They pay Jack Valenti in excess of $250,000 per year salary plus a generous expense account to watch after their 'interests' in Washington. He ends up earning more than the guy occupying 1600 Pennsylvania Avenue! The mere thought of any group of people** agreeing **to pay a fee for their product on a** VOLUNTARY **basis is totally outside their comprehension. They want (1)** proof **of viewing, (2)** enforcement **of sanctions for unreported viewing, (3)** penalties **for being caught engaging in unauthorized viewing. They will never,** never, **settle for anything less. They forced the 1909 Copyright Law to be rewritten in the late 70's, to favor their position vis-a-vis cable systems. This happened** after **the US Supreme Court found cable systems** NOT **liable for copyright** (i.e. program use) **fees. You may not care for these 'facts', nor care that a lobby group, headed up by a former Lyndon Johnson aide earning over $250,000 per year, can get so much of what they want. But that is what we are facing. A wise Washington counsel once observed** "The American system is simply one special interest group giving it to (an)other special interest group, with the aid and assistance of the US Congress". **At the moment,** we **are about to become the givee!**

TRANSPONDER WATCH

RECENT REPORTS OF ACTIVITY ON DOMESTIC / INTERNATIONAL SATELLITES

Send your reports to CSD Transponder Watch, P. O. Box 100858, Ft. Lauderdale, FL 33310. For late news, call (305) 771-0505.

F4 MAY have problems getting operational by 1 April. FCC decided RCA had not followed proper procedures in selling off transponders on bird, last fall. RCA has been ordered to re-do last fall's "auction" which saw 7 transponders selling for record $90 million. Until RCA devises FCC-aceptable plan , **those 7 transponders** probably will not activate on F4. The balance, those sold by RCA separately in other deals plus those moving from D1/D2 combo right, should be free to start up on F4. Testing of F4 bird now underway.

FCC decision may have long term implications for other bird owners. Basis for all transponder use, according to FCC, is that each and every 'original' transponder user/renter/owner must pay same price for same ('equivalent') service. FCC struck down approach that some transponders may rent or sell for more than others. How FCC will allow RCA to handle 5 watt versus 8.5 watt capable birds remains to be seen; in theory, 8.5 watt transponders could command higher price.

TED TURNER's CNN Radio network, on a sub-carrier on transponder 14 (F3R), scheduled to go into full time service 1 March.

NATIONAL Microtech has shown distributors new Z-1 receiver package. Package, forecast one year ago, gives viewer complete receiver functions plus control of antenna pointing parameters. At semi-annual distributor meeting NM reported distributor sales of Z-1, X-1 and ZX systems in excess of $20,000,000 for 1982.

BELL (AT & T) planning their own national satellite-radio network system link package. Service will use either Bell supplied, or customer owned ARO terminals, function 24 hours per day, and offer a wide variety of user selectable audio channel formats including stereo capability. Comstar bird to be used for service not yet announced.

BACK TO BACK satellite shows in Fort Worth/Dallas area just ahead. STTI's NSOC March 26-28 at Forth Worth Tarrant County Center (call 405/396-2574) while Satcom '82 put on by International Association of Satellite Users is in Dallas April 2-3 (call 703/893-2217). Big, annual National Association of Broadcasters show April 4-7 in Dallas (call 212/293-3500).

WESTAR 4 will take much of video load off of Westar 3; ABC, CNN and other services not intended for direct cable play will move to W4's 24 channel capacity. Later this year, when Westar 5 becomes operational ABC et all will move on again leaving behind primarily cable-only feeds.

ON AGAIN/off again ARABsat deal involving major US aerospace supplier Ford now appears on again.

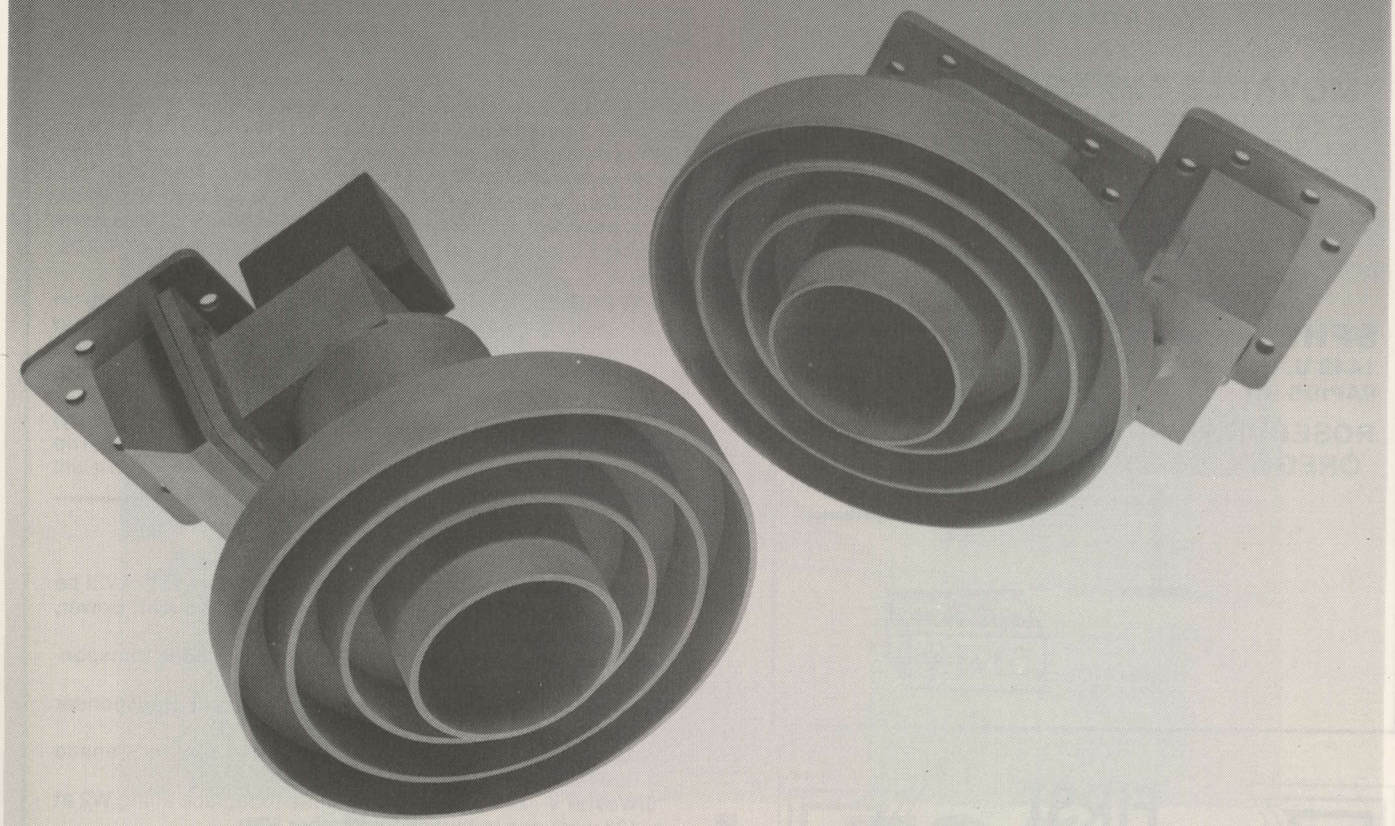
IF YOU intend to attend 1982 World's Fair in Knoxville, Tn. this year, the Comsat folks will treat you to a display and exhibit of 12 GHz DBS technology.

TV NEWS CLIPPINGS? A chap in Vancouver, BC, Frank Ogden, has come up with an intriguing concept. Armed with four Beta machines, he and others he is affiliated with in 25 cities, on six continents, have a list of 'clients' who are looking for anything televised about subjects of interest to them. A 'video press-clipping service'. If you would like to be a part of this project, write Frank directly at P.O. Box 3608, Vancouver, BC V6B 3Y6.

RCA F4 seems to be checking out OK, and you should be seeing video just ahead of receiving this issue of **CSD.** Remember that we are very anxious to plot the apparent coverage pattern of this new RCA bird, and the **February** issue of **CSD** contained a reporting from for that purpose. If you don't have a form, write down your transponder by transponder results and send them along to **CSD,** P.O. Box 100858, Fort Lauderdale, Fl. 33310.

LATEST end run to get a 12 GHz bird operating for European DBS may be through Switzerland. The Swiss postal authorities now considering a proposal to brodcast a mixed bag of Italian, German and French programming.

Two New Products from Chaparral:



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NEXT shuttle flight scheduled for March 22, if all goes well. First active flight, with birds on board, scheduled for late fall of this year.

CANADA re-clarified (for the sixty-seventh time, it seems) their 'policy' on private terminals. Now, at the moment, "resource camp" terminals (logging and mining) do **not** need licenses, **but** they are supposed to watch CANCOM service on A2/A3; **not US stuff.** New policy for anyone who wants to install a terminal to receive **non**-video and (radio) audio signals; such as data or news wire service. They will need a license, and only ANIK birds will be authorized.

PLAYBOY debuted its infrequent service-within-a-service on Escapade late in January. They have plans to re-name the service (to Playboy's advantage) and take over full time programming responsibility by summer. On F4.

EROS, meanwhile, is set to go again. They say they'll be up on Westar 3 March 1 with R rated movies from 11 PM to 2 AM eastern Thursday, Friday and Saturday. Satori and PET both seem to have bit the dust.

EXPERIMENTAL DBS 12 GHz service in Europe set to go on OT S-2, with a tenative start date of March/April. Service will be in English and it will be scrambled (!). First users will be on British isle of Malta in Mediterranean, plus possible drops to cable systems in Finland and Norway.

ATS-1, the oldest operating geo-stationary bird, will very (verrry) slowly move around the globe from recent 149 west to 162 east. Trip is not very far, in miles, but with virtually no fuel left on board it will take about 8 months to make. ATS-1 still in some (very) limited use for experimental programs.

QUICK FUTURE BIRD REFERENCE

1) **Westar IV** - was to have launched February 25th. Will be first 24 transponder Western Union bird, 8.5 watt power, and re-defined footprint favoring SE USA.
2) **Insat 1—A** - Indian domestic bird, with two video transponders, due to launch April 8th.
3) **Sirio 2** - Italian domestic satellite; exact transponder make-up unknown, due to launch April 15.
4) **ANIK D-1** - Replacement 24 transponder bird for Canada due to launch August 12th.
5) **Westar V** - 24 transponder satellite to replace ailing W2 at 123 west due to launch September 30th.
6) **Intelsat V (F6)** - Due to launch October.
7) **Satcom V** (Alascom 1) scheduled for 139 west, 24 transponders, 8.5 watts, due to launch November 18.
8) **SBS-C, TeleSat** (Canada) E bird scheduled for Shuttle launch in November.

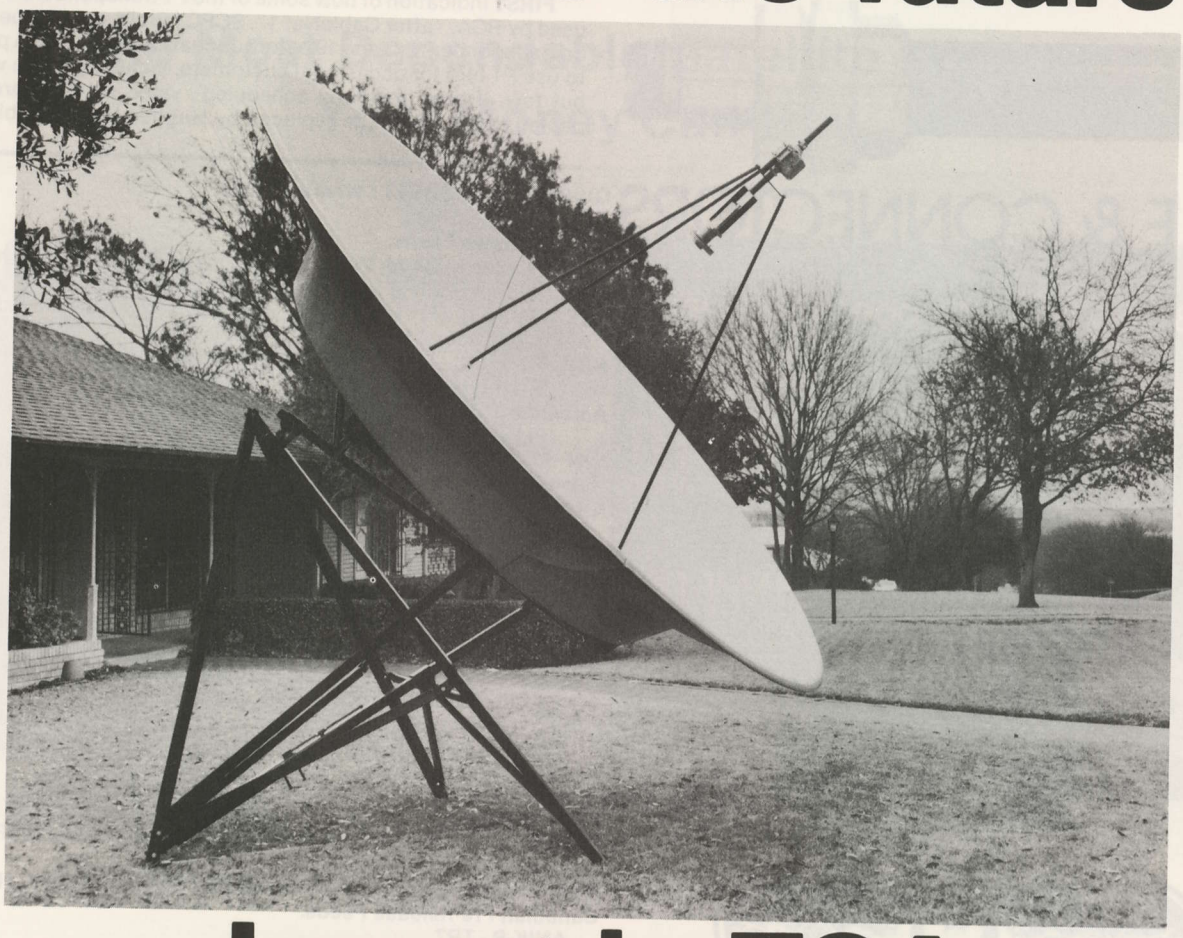
AMPLICA is now, formally, a part of COMSAT. Heads are still shaking over the $55 million paid for firm. Future direction of Amplica, which has been leading supplier of LNAs to the private terminal market, unclear. Several heavy Amplica users are not so sure Comsat General will allow the firm to continue servicing this market in this manner. And that is leading to speculation that anticipated 1982 'LNA crunch' may hit sooner, and be more difficult to solve, than previously anticipated. Wait and see, and bite your nails.

DIAL UP telephone service, using 4.5 meter dishes, began service in February. Western Satellite, Inc. opened 'Sat-Phone' service marketed to remote petroleum and mining and forestry operations. With 4.5 meter terminal, and associated electronics, user can 'patch into' the national telephone system via Westar 3.

MUTUAL radio network has now completed switch-over to satellite; all affiliates are now equipped with direct satellite feeds, or, are within land line or VHF radio link range of a local/regional site.

SATVISION, new monthly newsletter produced by SPACE for dealer members ($300 per year), came out on schedule in January with premiere issue. Details for dealers from SPACE, 1920 N Street NW (Suite 510), Washington, DC 20036 (202/887-0605).

For an investment that tracks the future



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Model TSA 126 specifications contain:

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FIRST indication of how some of the F1 transponders will be used by RCA, "after CableNet 1". SCPC (audio, data) appeared on transponders 2, 3 and 19 before January was over. RCA plans to use F1 bird for occasional customers, including some video but few, if any, 'regularly scheduled', video services are expected there. F1 will be replaced by Hughes Galaxie 1 bird in mid-1983. RCA will launch F1R slightly ahead of Hughes G1 bird (March 1983). F1R will only hold F1 spot for a few months (if at all), and then will be at 143 west. Ultimately, **119 west** spot of **F2** will be occupied by Southern Pacific Communications and **F1** spot at **135** by Hughes; RCA lost these orbit spots in FCC's 1980 orbit shuffle.

QUICK CHECK SHEET / Where To Find ...

Network News Feeds:

ABC - Westar 3, TR 19; Westar 1, TR1; delayed (four to five hours) Satcom F2, TR9.

CBS - Westar 3, TR 11; Westar 1, TR 1; Westar 2, TR 3; delayed (four to five hours) Satcom F2, TR9.

NBC - We star 1, TR 1; Comstar D3, TR1; Satcom F2 (delayed four to five hours), TR9.

Antennae-1 3- French network, Symphonie, 11 west, 12 noon to 1 PM eastern, TR12, 6.2 audio.

INN - Ghorizont (14° W), TR9 0800-1000 daily; Westar 2, TR3.

Network News Programs:

ABC - Good Morning America Westar 1, TR9 (1000-1200 weekdays); ABC World News Tonight Westar 3 (TR19) and Westar 1 (TR1) from approximately 6:30 PM to 7:30 PM weekdays. Night Line, most evenings (whole or in part) Westar 1, TR1, after 11 PM eastern. David Brinkley 11 AM Sundays, Westar 1, TR9.

CBS - Evening News (delayed for west coast), after 9 PM weekdays, TR1 or TR 9, Westar 1. Sixty Minutes, TR1 or TR 9, 10 PM eastern, Westar 1 (Sundays). CBS Sunday, TR9, Westar 1, 9 to 10:30 AM (Sundays).

NBC - Evening News (delayed for west coast), after 8 PM weekdays, TR1 or TR9, Westar 1 weekdays. Today Show, 7-9 AM, TR9, Westar 1.

Network Sports Programs:

ABC - Westar 3, TR19; Westar 1, TR1, 5 or 9.

CBS - Westar 3, TR11 (before CBS Cable sign on); Westar 1, TR1, 5 or 9.

NBC - Westar 1, TR1, 5 or 9; Satcom F2 TR8; Comstar D3, TR1.

Canadian Pre-Release Feeds:

ANIK-B - TR7.

Sporting Events (Independent)

Westar 1 - TR1,5,9.
Westar 2 - TR2
Westar 3 - TR1,5,9,11,13,23
Satcom F2 - TR8
Comstar D1,2 - 4,12,22,24

Network Schedule

NBC - TR1, Comstar D3 (not full schedule)

ABC - TR1, Westar 1 occasionally carries west coast feed **after** 11 PM eastern.

CBS - TR11, Westar 1 occasionally carries **east coast** feeds, at reduced EIRP level.

CBC French - TR15, Anik B

CBC English - TR11, Anik B (CBC 'North')

Televisa Cadena (XEW) TR5, Westar 3 with different feed TR5, Intelsat IV-A (53 west).

SIN - TR15, Westar 3.

Moscow 3 - TR9, Ghorizont (14 west), midnight to 10 AM (approximate) eastern.

Moscow 1 - Molniya (see **Coop's Operations Manual),** up to 24 hours per day in North American elipse.

TeleRebelde - (Habana), TR9, Ghorizont (14 west), 8 PM to 11 PM most evenings.

INTRODUCING: TRACKER II

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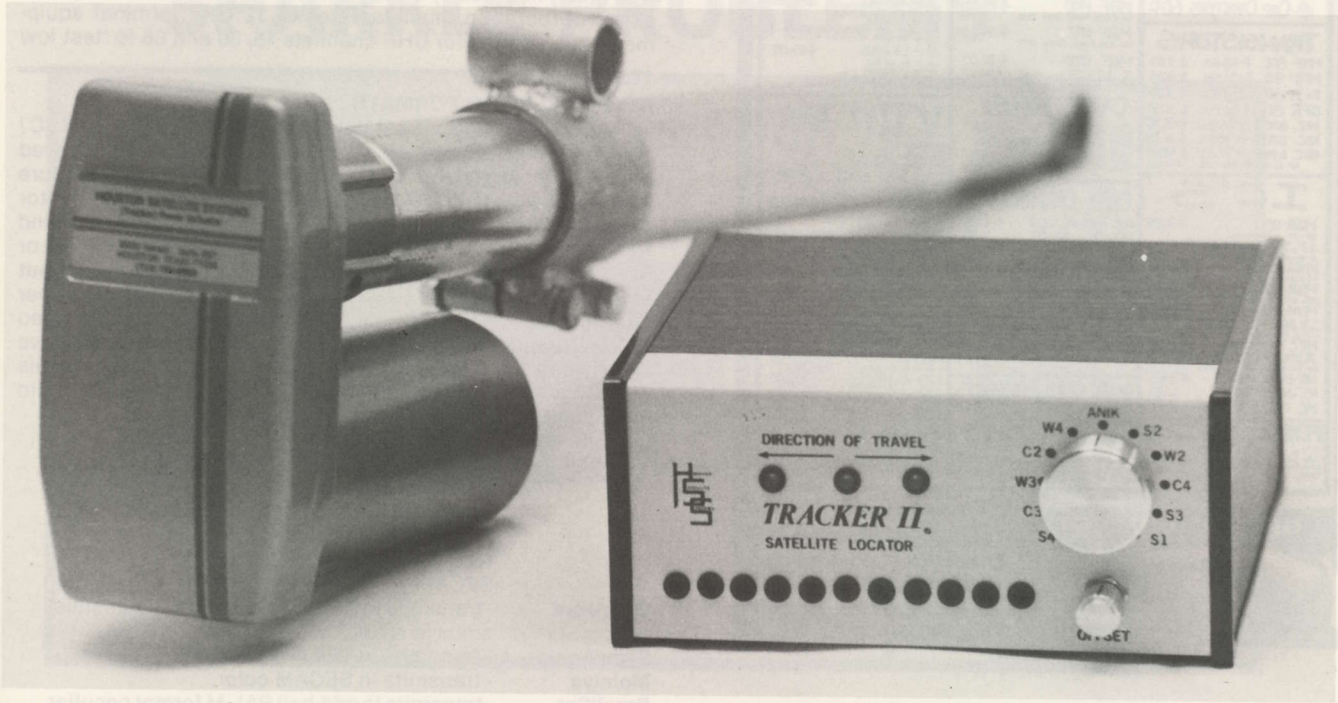

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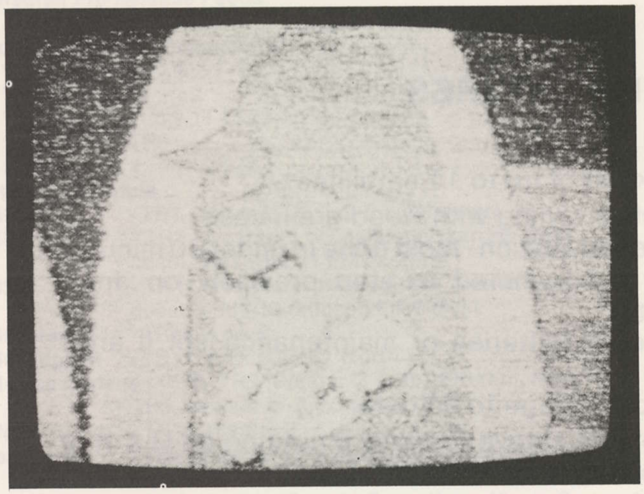
EXPERIMENTAL licenses. Several TVRO related firms have applied to FCC for "experimental licenses" to test low power TV hardware. With FCC freeze on normal LPTV stations, anyone wishing to develop hardware and systems is also 'frozen' unless they follow Commission's experimental licensing program. Coop found similar situation in 1977, with original home TVRO, was finally licensed by Commission for experimental **reception.** Orrox Corporation (manufacturer of 12 GHz terminal equipment) has applied for UHF channels 15, 30 and 68 to 'test low

NON-NTSC VIDEO FORMATS

Not all television, via satellite, is the North American NTSC / 525 line format. Most of the non-standard formats, when viewed on a NTSC color receiver or monitor, will produce a video picture **in black and white** however. To receive color requires a monitor capable of detecting the non-NTSC sub-carrier frequency, and format. A non-NTSC receiver, equipped for PAL, PAL-M or SECAM color video, may produce television in color, but with**out** audio. If your television modulator does not create the proper audio sub-carrier format, spacing the audio away from the video by the format-mandated frequency separation, you can have color video but no audio (through the non-NTSC TV). In this situation, listen to the audio, recovered via a tunable audio demodulator, directly through a local audio system.

Intelsat	- handles all of the world video formats and may transmit video in any of these formats, including the format of the originating country, or, the format of the destination country. Transmissions from west to east typically NTSC; from east to west typically PAL or SECAM.
Ghorizont	- transmits in SECAM color; Cuban transmissions in NTSC.
Symphonie	- transmits in SECAM color.
Molniya	- transmits in SECAM color.
BrasilSat	- transmits in odd-ball PAL-M format peculiar to Brasil.

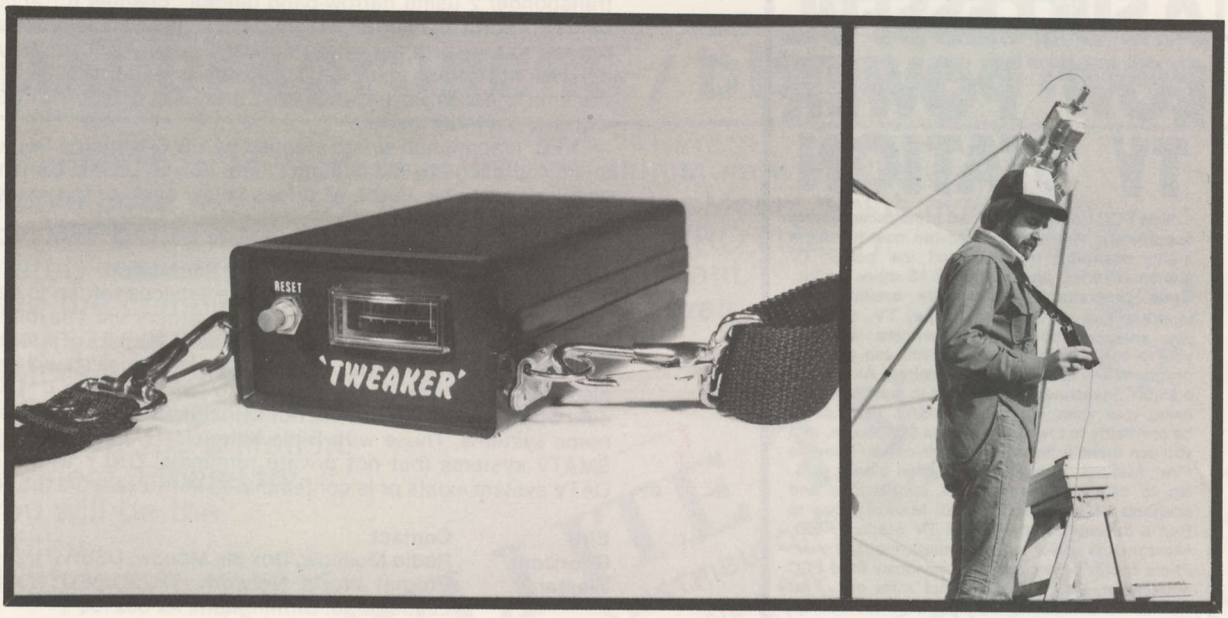


TELEVISA Cadena via Intelsat bird a 53 west, transponder 5, is circular polarized (RH). Video has also been noted on (US receiver position) **TR14 of late.**

power transmitter at various frequencies' with transmitter to be located at plant (1756/E Junction Avenue, San Jose, California). Earlier applicant, in Alabama, asked for permission to use VHF channel 7 for experiments relating to 'computer control of LPTV transmission equipment'.

INTELSAT will be 'bridge' between Europe and North America for 'wide band' data links with SBS on US end and British Telecom International (BTI) on UK end. IBM will be one of

Q: WHAT IS A 'TWEAKER'?
A: THE SOLUTION TO YOUR SPARKLE PROBLEMS



Is your antenna system tuned **precisely**? Probably not if you tune it up by watching a TV screen for "least sparklies." However, failure to accurately peak all antennal adjustments will result in a far worse picture than your system is actually capable of receiving. Sound familiar?

What you really need is an inexpensive, fast way to electronically optimize your system — a way to put some "eyes" on the signal and find out what is really going on.

INTRODUCING THE SATLAB 'TWEAKER'

— the professional tool for finding satellites, peaking LNA polarity, and maximizing antenna adjustments. Use it indoors at the receiver or out at the downconverter. Two models available: Model A utilizes the AGC meter output found on many receiver/downconverters (mini plugs and clip leads standard), while Model B inserts directly into the 70 mhz RF line at either receiver or downconverter end ("F" connectors standard). Both models feature pushbutton meter centering and enough sensitivity to actually "see" atmospheric changes and satellite variability. Deluxe neck strap, 20 feet of cable, and pamphlet, "How To Get The Most Out Of Your Satellite Antenna" included.

Finally you can "tweak out" all that sparkle. No satellite system is complete without a

'TWEAKER'

$129.95 Sugg. Ret. Price Model A
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NORTHWEST SATLABS

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first customers.

SUDDEN 'acceptance' of Ariane (French/European) launching facility, on coast of South America, causing growth problems. Present facility capable of six launches per year, with one fixed pad. New launch pad will be operational by 1985. Included in 1986 launch schedule are four US domestic birds (CBS-1, DBS, Satcom for a pair).

PUBSAT, a new tool to convey news and publicity releases via satellite to broadcasting stations, now operating Westar 1, transponder 2 using narrow-band (audio) "channel 6"; according to reports. Service is presently Tuesday-Thursday, but will expand to five days per week (Monday-Friday) April 1st. Radio (television) stations using service pay **no fee;** firms wishing to transmit releases pay between $200, and $300, to reach full USA with 1 to 5 minute limit(s).

NEC (Japan) had wrists slapped by US Commerce Department for allegedly "dumping" high power uplink transmit amplifier systems, in US, at prices below cost, or fair market value. US law forbids offshore firms engaging in non-competitive sales practices, although this is apparent first enforcement of law in satellite area. Buyer was Comsat.

DBS bird bidding has started; Comsat sent invitations to TRW, RCA Astro, GE, Ford and Hughes. Slated bid return date, with detailed proposals from each, April 1st.

ENTERTAINMENT Channel, RCA's effort to capture a part of the cable TV 'premium' programming business, will launch formally **on June 4th.** Service will be fed on a pair of SATCOM 4 channels (east and west coast). RCA characterizes their program service as "between HBO and PBS", and will use BBC and other foreign produced product, as well as broadway plays.

AUSTRALIA has announced that 12 GHz system, determined and reported in February **CSD**, will be built by Hughes. Birds will start launching mid 1985, and be similar in concept to Hughes SBS (HS 376) series.

FIRST Wold connected Hilton Hotels conference came off recently.

QUICK 'LEGAL' SHEET / Where to Get Permission

While many of the present satellite services refuse to deal with, or authorize, prive terminal viewing, others will. The following list represents the best intelligence as of the date of publication as to who will do what. Those with an asterisk **(*)** will deal **also** with SMATV systems. Those with twin asterisks **(**)** will deal with SMATV systems but **not** with private (single dwelling) home systems. Those with triple asterisk **(***)** will deal with SMATV systems (but not private terminals) **ONLY where** no CATV system exists or is contemplated in foreseeable future.

Bird	Contact
Ghorizont	Radio Moscow, Box 88, Mocow, USSR (*)
Westar 3	Eternal World Network (TR23), 5817 Old Leeds Road, Birmingham, Al. 35210 (*)
Comstar D½	Trinity Broadcasting Network (TR17), P.O. Box "A", Santa Ana, Ca. 92711 (*)
	National Christian Network (TR7 10 AM-5 PM), 1150 W. King St., Cocoa, Fl. 39222 (*)
Satcom F3R	Financial News Network (TR11), 2525 Ocean Park, Santa Monica, Ca. 90405 (*)
	ESPN, ESPN Plaza, Bristol, Ct. 06010 (***) (TR7)
	Modern Satellite Network, 45 Rockefeller Plaza, New York, New York 10020 (TR22)
	Cable News Network (including CNN-2), 1050 Techwood Dr. NW, Atlanta, Ga. 30318 (* - fee charged) (TR14, 15)
	Christian Broadcasting Network (CBN), Virginia Beach, Va. 23463 (*) (TR8)
	Peace Through Love (PTL), 7224 Park Rd., Charlotte, NC 28279 (*) (TR2)

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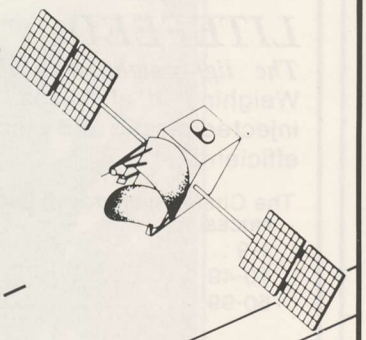
Our 11' antenna is 24 sections of .090 ga. aluminum with all steel single pole polar mount. Our antenna and Super Mount weigh over 575 lbs. We believe the heaviest in the home TVRO industry. Completely manufactured in our 20,000 sq. ft. plant. We have the complete system for over 50 channels of TV enjoyment. Receivers, LNAs, Rotors, Modulators and Cable. We designed our antenna and mount for home assembly. It should give you a lifetime of enjoyment. Please try one, you will be the envy of the neighborhood.



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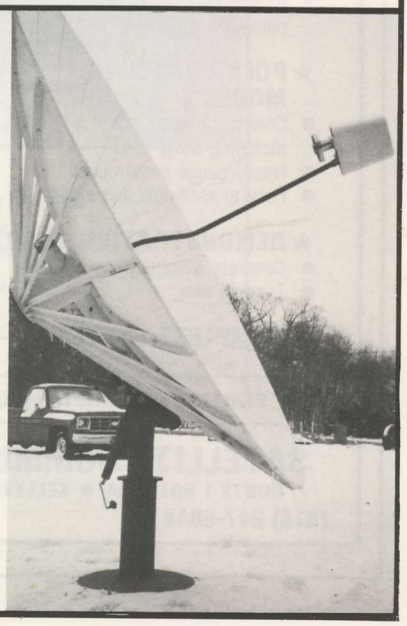
WE MANUFACTURE A TRAILER FOR ONE MAN ANTENNA INSTALLATION

ATTENTION MANUFACTURERS & DISTRIBUTORS

We are interested in several Manufacturers & Distributors interested in forming a buyers CO-OP for large quantity purchasing of electronics Receivers LNAs

WE WILL SEE YOU AT THE NATIONAL SATELLITE OPPORTUNITIES CONFERENCE IN FT. WORTH MARCH 26-27-28 1982



SATELLITE TV WEEK (P.O. Box 308, Fortuna, Ca. 95540) is new weekly newspaper-formated satellite TV program guide. Presently done in Pacific Coast (PST) version only, at $48 per year west coast and $65 per year elsewhere ($75 outside of USA), it contains listings for F1/F3 (F3R only by now) **plus** ANIK 2/3 (114 west), A-B (109 west), Westar 1 PBS listings (99 west), D1/D2 (95 west) and Westar 3 (91 west) cable service. Nothing slick about it, just basic listing and program information; recommended.

Concert Satellite Network (CSN) now up on Westar (TR5, W1 typically) Tuesday evenings with twin feeds; 9 PM and 12 midnight (eastern). Live rock concerts distributed to night clubs nationwide.

Richard Hogue "Weekdays" now being fed TR3, Westar 3 (6.8 audio) starting at 1230 eastern. Program is cross between hard sell religion and current events; John Davidson with a bible.

CBS TV continues to use TR12, Westar 3, 6.8 and 6.2 audio daytimes before sign-on of evening Catholic channel service.

Financial News Network TR7 on Westar 3 (6.8 audio) continues to package in-depth studies of corporate growth and economic factors with timely (15 minute delayed) stock market and commodity market pricing.

American Satellite Corporation, pioneer stand-alone user of bulk transponder space (starting with Westar 1 in 1975), now seeking FCC approval for three satellite domestic bird system. Proposal calls for first bird late 1985. Each would have half dozen transponders, 72 MHz wide, in 12 GHz downlink plus 18 transponders in 4 GHz downlink; 12 of these standard 36 MHz format, 6 with double-bandwidth format, 72 MHz. ASC presently owns 20% of overall Westar system, by virtue of early position as space broker, plus 50% of Advanced Westar system. ASC has avoided operations in video area to date, makes no detailed plans available on how it would use, lease or sub-lease out transponders in proposed new birds.

RCA has asked for permission to launch sixth SATCOM bird; January of 1985. In FCC data, RCA reports nine transponders would be set aside for video and/or audio services, eight by RCA government contracts, seven by narrow band packaging. RCA also said all 24 transponders would be 8.5 watt powered; eastern orbit spot capable of serving 48 contiguous states is

QUICK EXTRA SUB-CARRIER REFERENCE

Most of the cable programming services transmit their (program) audio on the 'standard' sub-carrier of 6.8 MHz. Many of the network feeds use the second 'standard' of 6.2 MHz for audio. Newer CATV multiple-audio-channel services, adding 'stereo' to the satellite transmission, will use two or more audio sub-carriers for that purpose, offering standard (non-stereo) audio on one sub-carrier (6.8) and stereo audio on a pair of other sub-carriers. Intelsat/Ghorizont feeds have their own 'standard' feed for audio sub-carriers; 5.8 MHz (for western nations), or, 7.4 MHz (for eastern block nations). A tunable audio sub-carrier detector is recommended if you want to be sure to be equipped for all of the audio that may be 'up there'!

Bird	Audio Format Found
D3	5.8 or 6.2 is 'standard'
W3	6.2 or 6.8 is 'standard', but 5.8 also found
D1,2	6.2 or 6.8 is 'standard', but 5.6, 5.9 and 6.1 also found
W1	6.2 or 6.8 is 'standard'
A-B	6.2 is standard (*)
A2/3	6.2 is standard (*)
F2	6.2 or 6.8 is 'standard'
W2	6.2 is standard
F3R	6.8 is standard; however 6.2, 6.3, 6.5, 7.7 plus 5.6/5.8 also found

*** - AUDIO "TINKLE" REMOVAL REQUIRES SPECIAL ANIK FILTER.**

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L

sought.

MA BELL has filed FCC tariff request to establish video teleconferencing network, starting with 16 cities this month (March), expanding to 42 cities by end of year. Not cheap; AT&T wants $600 for an hour of satellite time, or if you use newly constructed AT&T meeting rooms equipped with video gear, display equipment, price more than doubles to $1,340 per hour. Bell also proposing to equip regular customer rooms with necessary equipment, at cost of $124,800 per room (!) plus monthly rental of $13,420 for the equipment and $250 per mile between customer room and nearest suitable AT&T facility site.

STRANGE study of use of satellites for transmission of VOA and Radio Free Europe moving in House Government Operations Committee. They are looking at possibility that with VOA/RFE equipment aging and due for massive replacement before end of 80's decade, moving whole operation 'to satellites' may not be correct way to go. Students of proposal so far have been non-technical, political types, apparently oblivious to difficulties inherent with sending shortwave or medium wave signals 'back down through' earth's ionosphere, from above. Ionosphere acts as reflective 'shield', making long distance communications in these bands practical. However, the same shield that bounces signals around the earth **between** the shield and earth's surface also acts as a reverse-direction shield to keep inward bound signals 'out', if they originate from above the shield. For plan to work, high (very high) power satellites operating in some regular broadcast band VHF region (such as 100 MHz FM band) would be required.

H & R Communications, firm pioneered at SPTS 79 by a pair of Arkansas enthusiasts, has been purchased by Craig Corporation. The buyer firm has been in auto sound business for years as well as professional editing equipment for the motion picture industry. Under agreement, present management at H & R will continue, on multi year contract, and firm will retain present identity.

AS PREDICTED in **CSD** for December, Comsat will be establishing a 'network' of affiliated dealers to lease, sell, install and service 12 GHz terminals. Formal announcement was made at CES show in Las Vegas; to learn more about how it will work, contact Satellite Television Corp. / Judith Elnicki, 1301 Pennsylvania Avenue NW, Washington, D.C 20004 (202/626-3600).

WESTERN UNION will go off shore to use Ariane (French) launch facility for Westar 6 late in 1983. This will be first US domestic bird **not** to be lofted by NASA.

NBC scheduled to begin analog (not digital) distribution of NBC radio network programs March 1. S/A has won contract to provide several hundred receive only terminals, in $10,000 price range. Conversion to digital distribution has early 1982 target date. Individual NBC stations are being asked to pick up tab for individual terminals, suggesting that while S/A may have contract, others could sell a few here also.

RCA. If you need update data on status of any RCA satellite, try calling Ed Maxey or Bob Bernzten at Vernon Valley facility; 201/827-9400. Data on position of bird, reference 'window' should be available here.

HOLD UP. German and French DBS project is now officially off, as forecast here two months ago. German TV-SAT will not fly before May of 1985 while French TDF-1 bird will hold until late in same year. Both birds, 12 GHz, will have three DBS channels.

AMERICAN Hospital Video Network, one of firms that bought SBS 'spare transponder capacity', now wants to sub-let day part from 7 PM to 7 AM. AHVN operates 7 AM to 3 PM, will for now sit on 3 PM to 7 PM period. Anyone interested in talking about use of 12 GHz transponder time may contact AHVN at 404/351-4523.

BROADCASTERS continue to oppose FCC approval of 'interim' DBS service. Spokesman James Ebel says "so-called interim (DBS) is grave mistake" and authorization may "seriously compromise US bargaining position" at 1983 (western hemisphere) Regional Conference, designed to establish satellite orbit location assignments for next twenty years.

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_____

COOP'S COMMENT - continued from page 3

CONTEST

Several months ago we announced that **CSD** would sponsor a satellite receiving contest; designed to give every participant the opportunity to see just how good his system was performing. And there have been generous donations of (prize) equipment from most of the major manufacturers. And that includes five complete terminals, a big screen TV and so on.

I am no less enthusiastic about the contest, now, than I was back in August, when it was first announced. However, I believe the timing may be 'off' at this particular stage of our development. The problem, if indeed there could be one, is the application of Section 605 of the Communications Act. You will recall that 605 expressly forbids the "interception **and divulgence**" of common carrier transmissions. The " ... and divulgence" part has us concerned that participants in such a contest might be nailed by the FCC, or others, for "reporting" what they see and hear, in great detail, on the contest logging forms.

I can think of numerous arguments against such enforcement of 605, but I don't think this is the proper point in the industry to trot them out. We are still facing, probably quite soon, a renewed effort to adopt the pending Waxman legislation. And the last thing we need trotted out before some Congressional committee is a detailed analysis of what you and I have heard and seen, via satellites. The poor Congressmen considering the Waxman bill are already confused enough; there is no point in further confusing the issue!

So for now, a few months perhaps, the timing would appear to be off. I am working on obtaining a ruling on the whole concept, and if that comes through before Waxman dies (or blooms), we'll pick up where we left off with the contest concept. Keep your dishes oiled up and in the ready position!

DIRECTORY

This industry is growing so rapidly, and in so many diverse directions, that it is no longer possible to tick-off a verbal list of who supplies what, from where, to whom. New entrants to the field, as well as the older, established firms, are a blur of names and addresses.

The time has come to put together a comprehensive, all inclusive directory of firms and individuals offering satellite hardware and services to the home and SMATV marketplace. We will do it as an expanded, **regular issue** of **CSD.** Our target month for this is the September (1982) issue. Here is how it will work.

I've assembled a list of directory categories, which represents just about every area of activity in this field. For example, if you manufacture LNAs, there will be a directory section for that. If you manufacture mounts, another directory section. If you distribute cable, a directory section. If you are a dealer and sell retail only, a section for you as well.

We would like to have the directory not only completely comprehensive, but also 100% accurate. That will be tough when so many of us change our products and direction every month or two. One possible way to keep it current up to the closing date prior to publication is for everyone to wait until the last minute to send in our CSD supplied directory listing forms. That's a bad idea, however, since too much of a load at the end will only complicate production for us. So here is what we encourage you to do.

1) **Check through the listing appearing here.** This is our directory sections/category list. Chances are you will fit into one or more of the categories.
2) **Request, by category number,** directory questionnaire sheets. Write directly to **CSD** at **P.O. Box 100858, Fort Lauderdale, Fl. 33310** for these 'forms'. Instructions for returning them are on each form.
3) **Complete the forms** and send them back to us promptly. You will have an opportunity to modify or update your directory information, along about July, so don't worry about what changes may happen to you or your business in the interim.

Early in July, we will send out to each firm that has completed one or more of the questionnaires, a copy of the directory material that will be appearing in print. This will be **your proofing,** and correcting, copy. That's when you will make update changes and as well as corrections in case we screwed up with the initial information.

There is no charge to be listed. Everyone, even John Rohner, can be listed here. The only requirements are that you are **really** providing a product (and) or service, and, that there are no outstanding unresolved complaints about that product or service hanging about in the files (well, that takes care of Rohner!).

We anticipate that the distribution of the first industry-wide directory will be substantial; far beyond our normal **CSD** press run. We'll throw in a couple of features to help people evaluate products and services, so it will become both a source book for the industry, and a buyer's guide.

If you are a product supplier, we'll have room for many product photos. Check your files, and if they are empty of good black and white shots of what you build, add that to your list of things to get done in the next few weeks.

So? So get your request for questionnaire forms in. Time isawasting!

CSD DIRECTORY categories

To list your firm in the forthcoming CSD SATELLITE DIRECTORY, at no charge, you must complete Directory Questionnaire forms provided by **CSD.** Request these forms from CSD, P.O. Box 100858, Fort Lauderdale, Fl. 33310 by form number **only.**

OEM/Manufacturer:

101 - Manufacturer of TVRO antennas (complete antenna systems)
102 - Manufacturer of TVRO antenna **segments** (i.e. feeds, mounts, surfaces), but not complete antenna (systems)
201 - Manufacturer of TVRO receivers (complete receivers)
202 - Manufacturer of TVRO receiver modules, sub-sections, but **not** complete receivers
203 - Manufacturer of TVRO/ARO receiving system accessories (i.e. audio sub-carrier detectors, metering systems, modulators)
301 - Manufacturer of Low Noise Amplifiers (including LNCs)
401 - Manufacturer of any receiving system kits (defined as any system segment or module requiring assembly time by purchaser; antennas excluded)
501 - Manufacturer of cables, cable connectors
601 - Manufacturer/creator of user-oriented publications, reception aids, miscellaneous
701 - Manufacturer of test equipment intended in whole or in part for TVRO installations. For purposes of this Directory segment, an OEM is defined as anyone producing a product which bears their own brand name or identity even though some segments of the product may not be actually manufactured by them.

SERVICES

801 - Any firm supplying frequency coordination, interference studies, FCC licensing assistance as a 'charged-for' service
901 - Any firm supplying satellite transponder time for hire
1001 - Any firm supplying specialized satellite transmission services including teleconferencing and program coordination

DISTRIBUTOR

1101 - Any firm supplying TVRO hardware directly to dealers BUT **NOT** to ultimate users
1102 - Any firm supplying TVRO hardware to both dealers **AND** to ultimate users

DEALERS

1201 - Any firm supplying COMPLETE TVRO systems to ultimate users, including systems provided on an installed (i.e. turn-key) basis

CONSULTANTS

1401 - Any person or firm including one or more persons

specializing in the planning, designing of TVRO equipment, or, systems

MARKETING

1501 - Any person or firm specializing in the preparation of marketing programs for any phase or segment of TVRO sales

TRADE ASSOCIATION

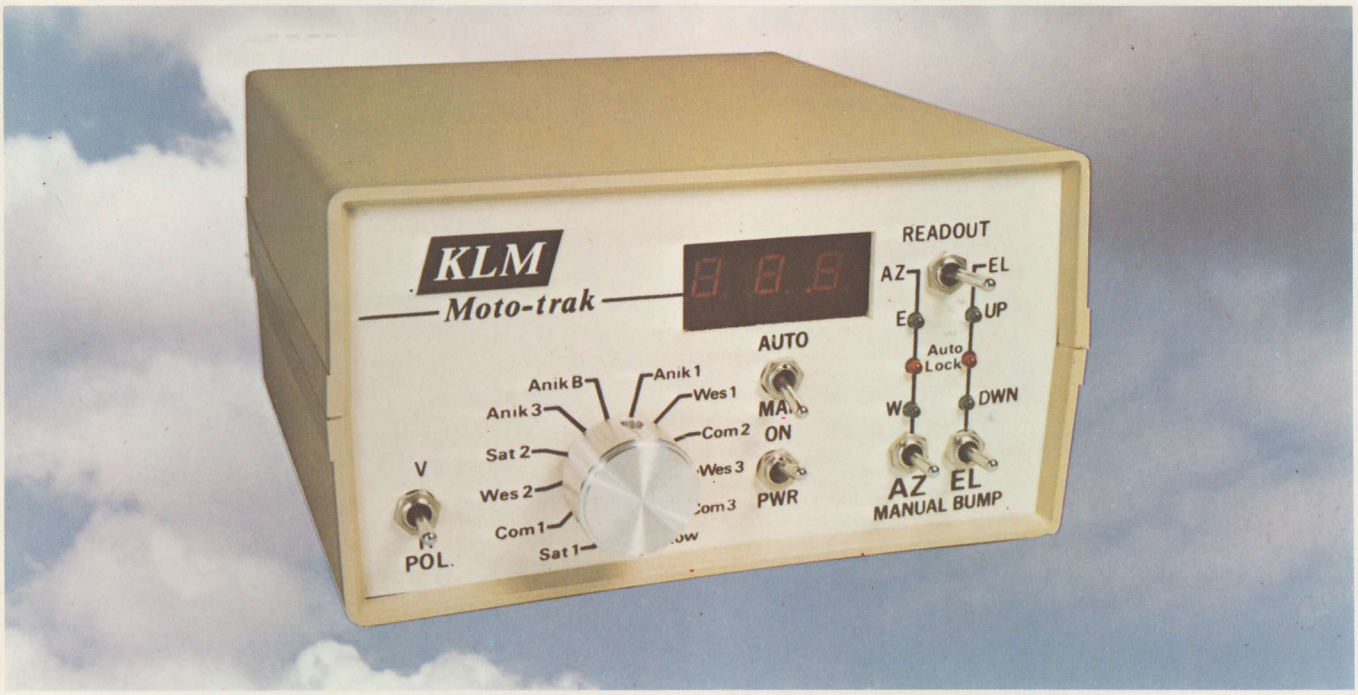
1601 - Any group of two or more individuals/firms representing any segment of the TVRO industry for the purpose of effecting legislation, regulatory rulings or sales trends on behalf of the industry as a whole

MISCELLANEOUS

1701 - Any business activity not fitting in whole, or in part, previously listed categories

The deadline for completing the initial directory forms, and returning them to **CSD,** is May 15th. Preview 'text' of the material prepared for your directory listing(s) will be sent to you for checking on or before July 1, 1981.

Moto-trak



Your key to ALL the satellites, ALL the programming, right from the comfort of your easy chair.

Satellite television offers so much to explore. Why settle for the one-satellite limitation of fixed dishes, or endless cranking at the dish in all kinds of weather? Enjoy all the convenience KLM's Moto-trak system has to offer . . .

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- Constant LED Azimuth/Elevation readout
- Polarity Control, for all channels, horizontal and vertical
- 12' solid aluminum dish or 16' screened dish for a perfect picture

And, enjoy the reliability of a motorized mount that's precision engineered from the ground up. Not an afterthought or a flimsy add-on, KLM's Moto-trak uses industrial quality reduction motors, gear, and screw drives, state-of-the-art motor control electronics.

Best of all, the Moto-trak system is a perfect match for KLM's reliable SKY EYE II and new SR-3 Satellite Receivers. Complete systems are available NOW. Once again, more of the performance, features, convenience, and reliability you've come to expect from KLM.

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- FIRST To Ship the Innovative Divide By 2 PLL
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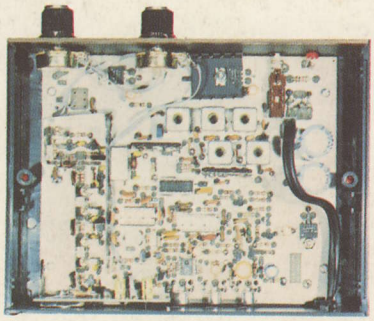
The Sat-tec R2B receiver is our latest full feature receiver, tailored to commercial equipment specifications at a price you can afford. the R2B's single board construction eliminates problematic interconnections and innovative utilization of all components results in a reliable and proven design. Operation is simple—a single tuning knob does it all, and our unique Channel-Lock AFC keeps the tuning sharp and accurate. A new feature is our variable audio tuning to give you complete selection of all subcarriers—without the use of additional plug-ins or devices. This, together with the R2B's full frequency coverage makes it truly compatible with all domestic and international satellites.

For superior value as well as lowest system cost, the choice is but one—the R2B! See your dealer today or write to us direct.



SPECIFICATIONS

Frequency range:	3.6-4.3 GHZ tunable
Audio range:	5.2-7.6 MHZ tunable
Threshold:	8db CNR
IF bandwidth:	30 MHz for full fidelity video
LNA power:	15 volts regulated for up to 2 LNAs
Outputs:	Standard one volt audio and video, compatible with VCRs, monitors and modulators
Optional:	BC-1 RF modulator kit, tunable channels 3-6 with sound

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